Genie®
A TEREX BRAND

Service Manual

Serial Number Range

GTH-1048
GTH-1056

from GTH1007A-11697
from GTH1007B-7101
from GTH1010-14001
from GTH1014E-10001

Part No. 123701
Rev F2
May 2015

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie GTH-1056 Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at an authorized dealer service center.

Compliance

Machine Classification
Group B/Type 3 as defined by ISO 16368

Machine Design Life
Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

Genie has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore, product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.

Contact Us:

http://www.genielift.com
e-mail: techsup@genieind.com

Serial Number Information

Genie offers the following Service Manuals for these models:

Title	Part No.
GTH-1056 Service Manual (from GTH1006A-8414 to GTH-1007A-11442)	97487

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Printed in U.S.A.

Revision History

Revision	Date	Section	Procedure / Schematic Page / Description
C	7/2012	2 - Spec.	2-5
		3 - Maint.	3-20, 3-22
		4 - Repair	4-56
		5 - Fault	5-2, 5-3
		6 - Schem.	6-4, 6-6, 6-10, 6-14, 6-18, 6-22
C1	3/2013	2 - Spec.	2-3, 2-7, 2-9, 2-11, 2-12, 2-13
		3 - Maint.	3-8, 3-19, 3-21, 3-22, 3-29, 3-31, 3-32, 3-33, 3-34
		6 - Schem.	6-22, 6-23
D	6/2013	5- Fault.	5-8 - 17, 5-18 - 19
E	8/23/2013	3-Maint	3-19, 3-21-22
F	9/2014	2 - Spec 3 - Maint. 2 - Fault 6 - Schem.	Hydraulic Oil A-6, D-7- ZF Transmission maint. Deutz Fault Codes Telematics Connector Legend, Electrical Schematic Harness Maps, 6-3
F1	3/2015	2 - Repair	4-55, Electrical Schematics, Hydraulic Schematics
F2	5/2015	6- Schem.	6-5, 6-40

Electronic Version

Click on any procedure or page number highlighted in blue to view the update.

REVISION HISTORY, CONTINUED

Revision	Date	Section	Procedure / Schematic Page / Description

Electronic Version

Click on any procedure or page number highlighted in blue to view the update.

Serial Number Legend

Genie
A TEREX BRAND

Terex South Dakota, Inc.
18340 NE 76th Street
Redmond, WA 98052
USA

MODEL: GTH1048

SERIAL NUMBER:GTH1007B-7101

ATTACHMENT:

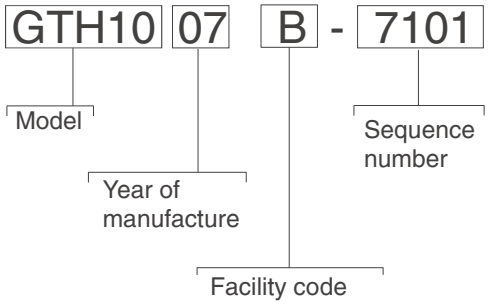
MANUFACTURE DATE:04/12/07

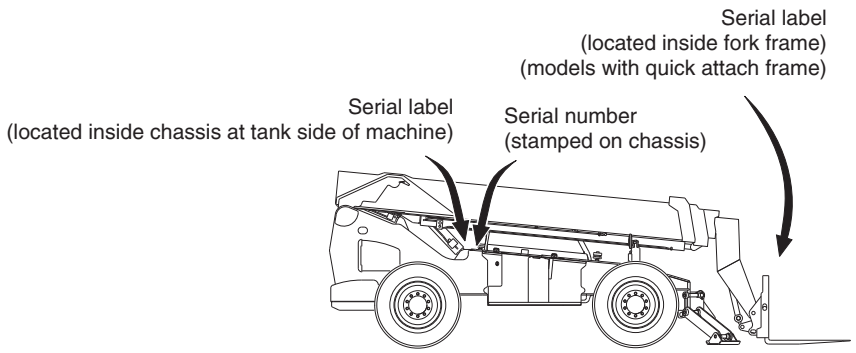
TOTAL TRUCK WEIGHT(LBS): 29,000lbs / 13,182kg

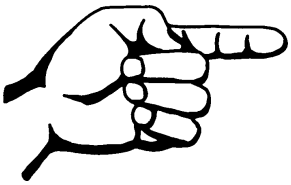
MAX LIFT CAPACITY(LBS):
10000 LBS

LIFT CAPACITY(LBS)
AT MAX LIFT HEIGHT: 6000 LBS
OUTRIGGERS UP: N/A
OUTRIGGERS DOWN: N/A

THIS FORKLIFT TRUCK COMPLIES
WITH:
ASME B56.6-2002 SAFETY STD FOR
ROUGH TERRAIN FORKLIFT TRUCK







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Safety Rules

Danger

Failure to obey the instructions and safety rules in this manual and the appropriate Operator's Manual on your machine will result in death or serious injury.

Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- ☑ You are trained and qualified to perform maintenance on this machine.
- ☑ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- ☑ You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.

Read each procedure thoroughly. This manual and the decals on the machine, use signal words to identify the following:

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Be sure to wear protective eye wear and other protective clothing if the situation warrants it.

Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

Workplace Safety

Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.

Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.

Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.

Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.

Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.

Be sure that your workshop or work area is properly ventilated and well lit.

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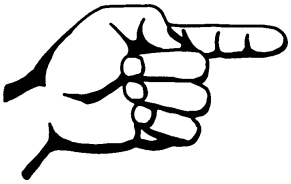

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Specifications

Machine Specifications

Fluid capacities	
Fuel tank	35 gallons 132.5 liters
Hydraulic tank	44 gallons 166.5 liters
Hydraulic system (including tank)	55 gallons 208.2 liters

For operational specifications, refer to the Operator's Manual.

Tires and wheels	
Tire size	14.00 x 24
Tire ply rating	12
Weight, rough terrain tire (air filled)	315 lbs 142.9 kg
Weight, rough terrain tire (foam filled)	967 ±35 lbs 439 ±16 kg
Weight, rock lug tire (foam filled)	1013 ±35 lbs 459 ±16 kg
Tire pressure (models with air-filled tires)	50 psi 3.45 bar
Lug nut torque	465 ft-lbs 630 Nm
Lug pattern	10 x 13.189
Wheel diameter	24 in 60.1 cm
Wheel width	9 in 22.9 cm

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SPECIFICATIONS

Performance Specifications

Drive speed, maximum	18 mph 29 km/h
Draw bar pull	29,000 lbs 13,154 kg
Lift capacity, maximum	10,000 lbs 4545 kg

Boom function speeds, maximum	
GTH-1048	
Boom up	12 to 14 seconds
Boom down	13 to 15 seconds
Boom extend	16 to 18 seconds
Boom retract	15 to 17 seconds
Fork rotate	19 to 21 seconds
GTH-1056	
Boom up	17 to 19 seconds
Boom down	23 to 25 seconds
Boom extend	14 to 16 seconds
Boom retract	13 to 15 seconds
Fork rotate	3 to 6 seconds

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Hydraulic Specifications

Hydraulic Fluid Specifications

Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and the viscosity index should exceed 140. They should provide excellent antiwear, oxidation, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Cleanliness level, minimum	15/13
Water content, maximum	250 ppm

Recommended Hydraulic Fluid

Hydraulic oil type	Chevron Rando HD Premium MV
Viscosity grade	32
Viscosity index	200

Optional fluids

Biodegradable	Petro Canada Environ MV 46
Fire resistant	UCON Hydrolube HP-5046
Mineral based	Shell Tellus S2 V 32 Shell Tellus S2 V 46 Chevron Hydraulic Oil 5606A

Note: Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult the Genie Service Department before use.

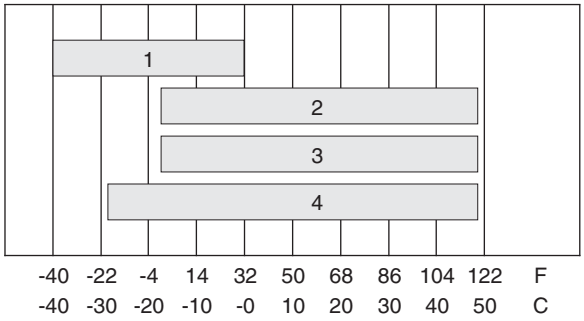
NOTICE Optional fluids may not have the same hydraulic lifespan and may result in component damage.

Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond it's maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE Do not top off with incompatible hydraulic fluids. Hydraulic fluids may be imcompatible due to the differences in base additive chemistry. When incompatible fluids are mixed, insoluble materials may form and deposit in the hydraulic system, plugging hydraulic lines, filters, control valves and may result in component damage.

Note: Do not operate the machine when the ambient air temperature is consistently above 120°F / 49°C.

Hydraulic Fluid Temperature Range



Ambient Air Temperature

1 Chevron hydraulic oil 5606A
2 Petro-Canada Environ MV 46
3 UCON Hydrolube HP-5046D
4 Chevron Rando HD Premium MV

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Chevron Rando HD Premium MV oil fluid properties

ISO grade	32
Viscosity index	200
Kinematic Viscosity	
cSt @ 200°F / 100°C	7.5
cSt @ 104°F / 40°C	33.5
Brookfield Viscosity	
cP @ -4°F / -20°C	1040
cP @ -22°F / -30°C	3310
Flash Point	375°F / 190°C
Pour Point	-58°F / -50°C
Maximum continuous operating temperature	171°F / 77°C

Note: An hydraulic oil heating system is recommended when the ambient termperature is consistently below 0°F / -18°C.

Note: Do not operate the machine when the ambient temperature is below -20°F / -29°C with Rando HD Premium MV.

Chevron 5606A hydraulic oil fluid properties

ISO grade	15
Viscosity index	300
Kinematic Viscosity	
cSt @ 200°F / 100°C	5.5
cSt @ 104°F / 40°C	15.0
cSt @ -40°F / -40°C	510
Brookfield Viscosity	
cP @ -4°F / -20°C	1040
cP @ -22°F / -30°C	3310
Flash Point	180°F / 82°C
Pour Point	-81°F / -63°C
Maximum continuous operating temperature	124°F / 51°C

Note: Use of Chevron 5606A hydraulic fluid, or equivalent, is required when ambient termperatures are consistently below 0°F / -18°C unless an oil heating system is used.

NOTICE Continued use of Chevron 5606A hydraulic fluid, or equivalent, when ambient temperatures are consistently above 32°F / 0°C may result in component damage.

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Petro-Canada Environ MV 46 oil fluid properties

ISO grade	46
Viscosity index	154
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 8 44.4
Flash Point	482°F / 250°C
Pour Point	-49°F / -45°C
Maximum continuous operating temperature	180°F / 82°C

UCON Hydrolube HP-5046 hydraulic oil fluid properties

ISO grade	46
Viscosity index	192
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C cSt @ -40°F / -40°C	 22 46 1300
Flash Point	None
Pour Point	-81°F / -63°C
Maximum continuous operating temperature	189°F / 87°C

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SPECIFICATIONS

Hydraulic Components Specifications

Function Pump	
Type:	variable displacement piston pump
Displacement	0 to 3.66 cu in 0 to 60 cc
Flow rate @ 2400 rpm	38 gpm 144 L/min
Pump pressure, maximum	3190 psi 220 bar
Pressure compensator	3190 psi 220 bar
Standby pressure	464 psi 32 bar

Primary Function Manifold	
System relief valve pressure, maximum (measured at test port TP)	3500 psi 241 bar
Boom extend relief valve pressure, maximum	3500 psi 241 bar
Fork tilt relief valve pressure, maximum	3500 psi 241 bar
Flow regulator, Fork tilt circuit	14 gpm 53 L/min
Flow regulator, Sway circuit	2 gpm 7.5 L/min
Flow regulator, Pilot pressure bleed circuit	0.1 gpm 1.4 L/min

Secondary Function Manifold	
Steer relief valve pressure, maximum (measured at test port TS)	2500 psi 172 bar
Parking brake relief valve pressure, maximum (measured at test port TPB)	400 psi 27.5 bar
Diff lock relief valve pressure, maximum (measured at test port TJ)	400 psi 27.5 bar
Rear lock-up relief valve pressure, maximum (measured at test port TR)	50 psi 3.4 bar

Outrigger Manifold	
Flow regulator, Outrigger circuit	6 gpm 22.7 L/min

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Manifold Component Specifications

Plug torque	
SAE No. 2	50 in-lbs / 6 Nm
SAE No. 4	13 ft-lbs / 18 Nm
SAE No. 6	18 ft-lbs / 24 Nm
SAE No. 8	50 ft-lbs / 68 Nm
SAE No. 10	55 ft-lbs / 75 Nm
SAE No. 12	75 ft-lbs / 102 Nm

AC Refrigerant Specifications

System Full Charge	
R134a	1 lb 14 oz

Valve Coil Resistance Specifications

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

Description	Specification
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items AA, AD, AY, AAB and BAA)	8.9Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items AAC)	8.9Ω
DO3 valve, 3 position 4 way 12V DC with diode (schematic items CA and EB)	5.6Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items FA)	8.8Ω
Solenoid valve, 2 position 3 way 12V DC with diode (schematic items CF, CO and CP)	8.9Ω
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items CG)	7.3Ω
Solenoid valve, 3 position 4 way 12V DC with diode (schematic items DA and DB)	7.3Ω

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SPECIFICATIONS

John Deere 4045HF485 Engine

Displacement	275 cu in 4.5 liters
Number of cylinders	4
Bore & stroke	4.19 x 5 inches 106 x 127 mm
Horsepower	125 @ 2400 rpm 93.2 kw @ 2400 rpm
Firing order	1 - 3 - 4 - 2
Low idle Frequency	800 rpm 160 Hz
High idle Frequency	2400 rpm 480 Hz
Compression ratio	17:1
Valve clearances, cold	
Intake	0.14 in 0.36 mm
Exhaust	0.18 in 0.46 mm
Lubrication system	
Oil pressure (warm, at rated speed with full load)	60±25 psi 4.13±1.7 bar
Oil pressure (warm, at low idle)	15 psi 1 bar
Oil capacity (including filter)	14 quarts 13.2 liters

Oil viscosity requirements

Units ship with John Deere Engine Break-In Oil. During the break-in period, add John Deere Engine Break-In Oil as needed to maintain the specified oil level.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator's Manual on your machine.

Injection system	
Injection pump make	Stanadyne
Peak injection pressure	10,000 psi 690 bar

Fuel requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Engine coolant	
Capacity	7 gallons 26.5 liters
Alternator	
Output	95 A, 14V DC
Battery	
Type	12V DC
Group	C31
Quantity	1
Cold cranking ampere @ 0°F	1000A
Reserve capacity @ 25A rate	200 minutes

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Deutz TCD3.6 L4 Engine

Displacement	221 cu in 3.62 liters
Number of cylinders	4
Bore & stroke	3.86 x 4.72 inches 98 x 120 mm
Horsepower	100 @ 2300 rpm 74.6 kw @ 2300 rpm
Peak Torque	302 lb-ft @ 1600 rpm 409 Nm @ 1600 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	17.2:1
Combustion	Direct injection
Governor	Electronic
Low idle Frequency	1000 rpm 200 Hz
High idle Frequency	2400 rpm 500 Hz

Lubrication system

Minimum oil pressure (warm, at low idle)	23.5 psi 1.6 bar
Oil capacity (including filter)	9.5 quarts 9 liters

Oil viscosity requirements

Units ship with 15W-40 API CJ4 low emission (LE) oil. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator's Manual on your machine.

Fuel requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Fuel injection pressure, maximum	23200 psi 1600 bar

Engine coolant

Capacity	4.5 gallons 17 liters
Type	Extended Life

Alternator

Output	95 A, 12V DC

Starter Motor

Normal load	300-400 A
Relay max	60 A
Relay continuous	12 A
Cranking speed	>100 rpm

Glow Plugs

Initial load (0-6 sec)	80 amps
Continuous load (>6 sec)	<40 amps

Battery

Type	12V DC
Group	C31
Quantity	1
Cold cranking ampere @ 0°F	1000A
Reserve capacity @ 25A rate	200 minutes

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Perkins 1104D-E44TA Engine

Displacement	269 cu in 4.4 liters
Number of cylinders	4
Bore and stroke	4.13 x 5 inches 105 x 127 mm
Horsepower	125 @ 2400 rpm 93.2 kW @ 2400 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	16.2:1
Low idle Frequency	1000 rpm 200 Hz
High idle Frequency	2500 rpm 500 Hz
Valve clearance, cold	
Intake	0.013 in 0.35 mm
Exhaust	0.013 in 0.35 mm
Lubrication system	
Oil pressure at operating temperature	43-58 psi 2.96-4 bar
Oil capacity (including filter)	10 quarts 9.5 liters
Oil viscosity requirements	
Units ship with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operation and Maintenance Manual on your machine.	
Injection system	
Injector pressure, minimum	23700 psi 1634 bar
Fuel requirement	
For fuel requirements, refer to the engine Operation Manual on your machine.	
Engine coolant	
Capacity	4.6 gallons 17 liters
Type	Extended Life
Alternator	
Output	85 A, 14V DC
Fan belt tension	90 ft-lb 400 N
Alternator bolt torque	16 ft-lb 22 Nm
Starter Motor	
Normal load	68 A
Relay max	50 A
Relay continuous	20 A
Cranking speed	130 - 200 rpm
Glow Plugs	
Initial load (0-4 sec)	20 amps (ea)
Continuous load (>4 sec)	15 amps (ea)
Battery	
Type	12V DC
Group	C31
Quantity	1
Cold cranking ampere @ 0°F	1000A
Reserve capacity @ 25A rate	200 minutes

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Perkins 1204E-E44TA Engine

Displacement	268.5 cu in 4.4 liters
Number of cylinders	4
Bore and stroke	4.13 x 4.99 inches 105 x 124 mm
Horsepower	124 @ 2000 rpm 92.7 kW @ 2000 rpm
Peak Torque	391 lb-ft @ 1400 rpm 530 Nm @ 1400 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	16.5:1
Governor	Electronic
Low idle Frequency	800 rpm Hz
High idle Frequency	2200 rpm Hz
Lubrication system	
Pressure (Hot @ 2300 rpm)	28 - 64 psi
Minimum oil pressure	7.1 psi 0.49 bar
Maximum oil capacity (including filter)	8.8 quarts 8.3 liters

Oil viscosity requirements

Units ship with 15W-40 API CJ4 low ash oil.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operation and Maintenance Manual on your machine.

Fuel requirement

For fuel requirements, refer to the engine Operation Manual on your machine.

Fuel Injection Pressure	23000 psi 1585 bar
Engine coolant	
Capacity	4.9 gallons 18.5 liters
Type	Extended Life
Alternator	
Output	120 A, 12V DC
Starter Motor	
Normal load	155 A
Relay max	50 A
Relay continuous	15 A
Cranking speed	200 - 300 rpm
Glow Plugs	
Initial load (0-6 sec)	12 amps (ea)
Continuous load (>6 sec)	16 amps (ea)
Battery	
Type	12V DC
Group	C31
Quantity	1
Cold cranking ampere @ 0°F	1000A
Reserve capacity @ 25A rate	200 minutes

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Dana T20000 Transmission

Transmission Type	3 speed powershift converter
Speeds, Forward	3
Speeds, Reverse	3
Torque Converter	
Maximum input	3100 rpm
Size	12 inches
Lubrication	
Oil capacity	20 quarts 18.9 liters
Oil viscosity requirements	
Units ship with Chevron RPM SAE 10W. Extreme operating temperatures may require the use of alternative transmission oils. For oil requirements, refer to the *Dana T20000 Maintenance Manual* (Dana part number 0202).	
Dana 0202 Maintenance Manual Genie part number	115025

ZF 4 WG-98 TC Transmission

Transmission Type	4 speed powershift converter
Speeds, Forward	4
Speeds, Reverse	3
Torque Converter	
Maximum input	2600 rpm
Maximum torque	480 Nm
Lubrication	
Oil capacity	16.9 quarts 16 liters
Oil viscosity requirements	
Units ship with Chevron Delo 400 LE SAE 15W40. Extreme operating temperatures may require the use of alternative transmission oils. For oil requirements, refer to the *ZF 4 WG-98 TC Maintenance Manual* (ZF part number 5872 134 002).	
ZF 4 WG-98 TC Operating Manual Genie part number	1258405

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Dana Planetary 213 Drive Axle

Steering	Intergrated steer cylinder
Joints	Heavy duty double U-joints
Steering angle, maximum	45°
Front Axle Lubrication	
Front differential	15 quarts 14.2 liters
Axle planetary end (each)	2 quarts 1.9 liters
Rear Axle Lubrication	
Rear differential	15 quarts 14.2 liters
Axle planetary end (each)	2 quarts 1.9 liters
Oil viscosity requirements	
Differential	Chervron Supreme 80W90 LS
Planetary ends	Chervron Supreme 80W90 LS
For additional axle information, refer to the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).	
Dana 213 Axle Maintenance and Repair Manual Genie part number	115026

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

Seal-Lok™ Fittings
(hose end - ORFS)

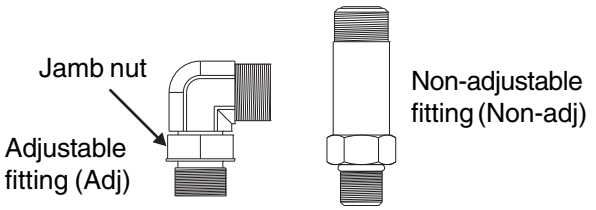
SAE Dash size	Torque
-4	10 ft-lbs / 13.6 Nm
-6	30 ft-lbs / 40.7 Nm
-8	40 ft-lbs / 54.2 Nm
-10	60 ft-lbs / 81.3 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	140 ft-lbs / 190 Nm
-24	180 ft-lbs / 245 Nm

JIC 37° Fittings
(swivel nut or hose connection)

SAE Dash size	Thread Size	Flats
-4	7/16-20	2
-6	9/16-18	1 1/4
-8	3/4-16	1
-10	7/8-14	1
-12	1 1/16-12	1
-16	1 5/16-12	1
-20	1 5/8-12	1
-24	1 7/8-12	1

SAE O-ring Boss Port
(tube fitting - installed into Aluminum)
(all types)

SAE Dash size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31.2 Nm
-8	36 ft-lbs / 54.2 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169.5 Nm
-20	151 ft-lbs / 204.7 Nm
-24	184 ft-lbs / 249.5 Nm



SAE O-ring Boss Port
(tube fitting - installed into Steel)

SAE Dash size		Torque
-4	ORFS / 37° (Adj)	15 ft-lbs / 20.3 Nm
	ORFS (Non-adj)	26 ft-lbs / 35.3 Nm
	37° (Non-adj)	22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj)	35 ft-lbs / 47.5 Nm
	37° (Adj / Non-adj)	29 ft-lbs / 39.3 Nm
-8	ORFS (Adj / Non-adj)	60 ft-lbs / 81.3 Nm
	37° (Adj / Non-adj)	52 ft-lbs / 70.5 Nm
-10	ORFS (Adj / Non-adj)	100 ft-lbs / 135.6 Nm
	37° (Adj / Non-adj)	85 ft-lbs / 115.3 Nm
-12	(All types)	135 ft-lbs / 183 Nm
-16	(All types)	200 ft-lbs / 271.2 Nm
-20	(All types)	250 ft-lbs / 339 Nm
-24	(All types)	305 ft-lbs / 413.5 Nm

Torque Procedure

Seal-Lok™ fittings

1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

Note: The O-rings used in the Parker Seal Lok™ fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

2 Lubricate the O-ring before installation.

3 Be sure that the face seal O-ring is seated and retained properly.

4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.

5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.

6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

JIC 37° fittings

1 Align the tube flare (hex nut) against the nose of the fitting body (body hex fitting) and tighten the hex nut to the body hex fitting to hand-tight, approximately 30 in-lbs / 3.4 Nm.

2 Make a reference mark on one of the flats of the hex nut, and continue it on to the body hex fitting with a permanent ink marker. Refer to Figure 1.

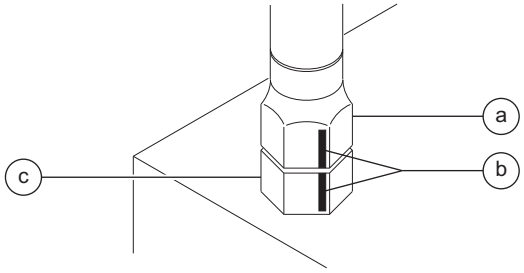


Figure 1

a hex nut
b reference mark
c body hex fitting

3 Working clockwise on the body hex fitting, make a second mark with a permanent ink marker to indicate the proper tightening position. Refer to Figure 2.

Note: Use the *JIC 37° Fittings* table on the previous page to determine the correct number of flats for the proper tightening position.

Note: The marks indicate that the correct tightening positions have been determined. Use the second mark on the body hex fitting to properly tighten the joint after it has been loosened.

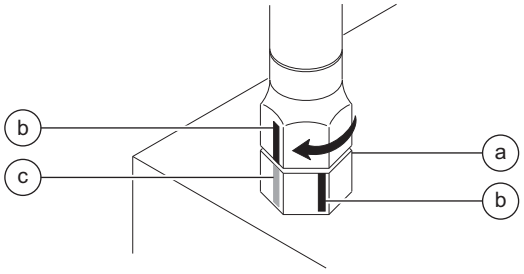


Figure 2

a body hex fitting
b reference mark
c second mark

SPECIFICATIONS

4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.

5 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

SPECIFICATIONS

SAE FASTENER TORQUE CHART

• This chart is to be used as a guide only unless noted elsewhere in this manual •

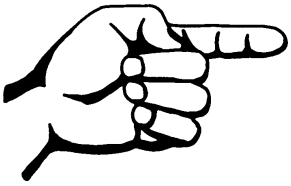
SIZE	THREAD	Grade 5				Grade 8				A574 High Strength Black Oxide Bolts	
		LUBED		DRY		LUBED		DRY		LUBED	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	80	9	100	11.3	110	12.4	140	15.8	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		LUBED		DRY		LUBED		DRY		LUBED	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	82.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	430	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1 1/8	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1 1/4	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1 1/2	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

METRIC FASTENER TORQUE CHART

• This chart is to be used as a guide only unless noted elsewhere in this manual •

Size (mm)	Class 4.6				Class 8.8				Class 10.9				Class 12.9			
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	16	1.8	21	2.4	41	4.63	54	6.18	58	6.63	78	8.84	68	7.75	91	10.3
6	19	3.05	36	4.07	69	7.87	93	10.5	100	11.3	132	15	116	13.2	155	17.6
7	45	5.12	60	6.83	116	13.2	155	17.6	167	18.9	223	25.2	1.95	22.1	260	29.4
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.4	7.41	7.2	9.88	14	19.1	18.8	25.5	20.1	27.3	26.9	36.5	23.6	32	31.4	42.6
10	10.8	14.7	14.4	19.6	27.9	37.8	37.2	50.5	39.9	54.1	53.2	72.2	46.7	63.3	62.3	84.4
12	18.9	25.6	25.1	34.1	48.6	66	64.9	88	69.7	94.5	92.2	125	81	110	108	147
14	30.1	40.8	40	54.3	77.4	105	103	140	110	150	147	200	129	175	172	234
16	46.9	63.6	62.5	84.8	125	170	166	226	173	235	230	313	202	274	269	365
18	64.5	87.5	86.2	117	171	233	229	311	238	323	317	430	278	377	371	503
20	91	124	121	165	243	330	325	441	337	458	450	610	394	535	525	713
22	124	169	166	225	331	450	442	600	458	622	612	830	536	727	715	970
24	157	214	210	285	420	570	562	762	583	791	778	1055	682	925	909	1233

SPECIFICATIONS



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Scheduled Maintenance Procedures

Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, semi-annually, annually and every 2 years as specified on the *Maintenance Inspection Report.*

⚠WARNING Failure to perform each procedure as presented and scheduled could result in death, serious injury or substantial damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Use only Genie approved replacement parts.
- ☑ Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.
- ☑ Unless otherwise specified, perform each maintenance procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Key switch in the off position with the key removed
  - Wheels chocked

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings and step-by-step instructions.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

SCHEDULED MAINTENANCE PROCEDURES

Maintenance Symbols Legend

Note: The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.

Indicates that tools will be required to perform this procedure.

Indicates that new parts will be required to perform this procedure.

Indicates that a cold engine will be required to perform this procedure.

Indicates that a warm engine will be required to perform this procedure.

Indicates that dealer service will be required to perform this procedure.

Pre-delivery Preparation Report

The pre-delivery preparation report contains checklists for each type of scheduled inspection.

Make copies of the *Pre-delivery Preparation* report to use for each inspection. Store completed forms as required.

Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, semi-annually, annually, and two year. The *Scheduled Maintenance Procedures Section and the Maintenance Inspection Report* have been divided into five subsections—A, B, C, D, and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Checklist
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Semi-annually or every 500 hours	A + B + C
Annually or every 1000 hours	A + B + C + D
Two year or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the *Maintenance Inspection Report* to use for each inspection. Store completed forms for three years.

Pre-Delivery Preparation

Fundamentals

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed. Follow the instructions in the operator's manual.

If any inspection receives an N, remove the machine from service, repair and reinspect it. After repair, place a check in the R box.

Legend

Y = yes, completed
N = no, unable to complete
R = repaired

Comments

Pre-Delivery Preparation	Y	N	R
Pre-operation inspection completed			
Maintenance items completed			
Function tests completed			

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Genie
A TEREX BRAND

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PO Box 1150
Watertown, SD 57201-6150
(605) 882-4000

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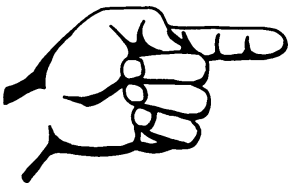

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Maintenance Inspection Report

Model

Serial number

Date

Hour meter

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

☐	**Daily or 8 hour Inspection:**	**A**
☐	**Quarterly or 250 hour Inspection:**	**A+B**
☐	**Semi-annually or 500 hour Inspection:**	**A+B+C**
☐	**Annually or 1000 hour Inspection:**	**A+B+C+D**
☐	**2 Year or 2000 hour Inspection:**	**A+B+C+D+E**

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an “N”, tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the “R” box.

Legend

Y = yes, acceptable

N = no, remove from service

R = repaired

Comments

Checklist A	**Y**	**N**	**R**
A-1 Manuals and decals			
A-2 Pre-operation inspect			
A-3 Function tests			
A-4 Lubricate boom			
A-5 Engine maintenance			
A-6 Transmission maintenance			
Perform after 40 hours:			
A-7 30 day service			
Perform every 50 hours:			
A-8 Axle maintenance			
Perform after 100 hours:			
A-9 Engine maintenance - John Deere models			
A-10 Axle maintenance			
Perform every 200 hours:			
A-11 Axle maintenance			

Checklist B	**Y**	**N**	**R**
B-1 Battery			
B-2 Electrical wiring			
B-3 Exhaust system			
B-4 Engine air filter			
B-5 Tires and wheels			
B-6 Hydraulic oil			
B-7 Tank venting systems			
B-8 Boom wear pads			
B-9 Lubricate driveshafts			
B-10 Engine maintenance - John Deere models			
B-11 Engine maintenance - Deutz models			

Checklist C	**Y**	**N**	**R**
C-1 Engine maintenance - John Deere models			
C-2 Axle maintenance			
C-3 Dana Transmission maintenance			
C-4 Engine maintenance - Deutz models			
C-5 Engine maintenance - Perkins models			

Checklist C (cont.)	**Y**	**N**	**R**
C-6 Engine maintenance - Perkins models			
C-7 Inspect and lubricate chains			
C-8 Sequencing chains			
Perform every 700 hours:			
C-9 Axle maintenance			
Perform every 800 hours:			
C-10 Axle maintenance			

Checklist D	**Y**	**N**	**R**
D-1 Forks			
D-2 Hydraulic return filter			
D-3 Dana Transmission maintenance			
D-4 Axle maintenance			
D-5 Engine maintenance - Deutz models			
D-6 Engine maintenance - Perkins models			
D-7 ZF Transmission maintenance			

Checklist E	**Y**	**N**	**R**
E-1 Hydraulic oil			
E-2 Engine maintenance - John Deere models			
E-3 Engine maintenance - Perkins models			
Perform every 3000 hours:			
E-4 Engine maintenance - Deutz models			
E-5 Engine maintenance - Perkins models			
Perform every 4000 hours:			
E-6 Engine maintenance - Perkins models			
Perform every 4500 hours:			
E-7 Engine maintenance - John Deere models			
Perform every 5000 hours:			
E-8 Engine maintenance - Deutz models			
Perform every 12,000 hours:			
E-9 Engine maintenance - Perkins models			

Checklist A Procedures

A-1
Inspect the Manuals and Decals

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the operator's compartment. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

In addition, maintaining all of the safety and instructional decals in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

1 Check to make sure that the operator's and safety manuals are present and complete in the storage container in the operator's compartment.

2 Examine the pages of each manual to be sure that they are legible and in good condition.

⊙ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.

⊠ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or is illegible. Remove the machine from service until the manual is replaced.

3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.

⊙ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.

⊠ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.

4 Always return the manuals to the storage container after use.

Note: Contact your authorized Genie distributor or Genie Industries if replacement manuals or decals are needed.

A-2
Perform Pre-operation Inspection

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing a Pre-operation Inspection is essential to safe machine operation. The Pre-operation Inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The Pre-operation Inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-3
Perform Function Tests

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

CHECKLIST A PROCEDURES

A-4
Lubricate the Boom

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Greasing the specified locations is essential for good machine performance and service life. Operating the machine with little or no grease may cause the machine to perform poorly and continued use could cause component damage.

1 Fully extend the boom. Raise the boom as needed.

2 Lubricate the top and bottom boom tube wear pads.

Note: Do not lubricate the side wear pads.

3 Return the boom to the stowed position.

Grease Specification
Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

A-5
Perform Engine Maintenance - All Models

Note: Engine specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Engine oil level - check
Coolant level - check/add
Fuel system filter/water separator - drain
Engine tightness - check or leaks
Exhaust system - check for leaks

Required maintenance procedures and additional engine information is available in the *Perkins 1100D Operation and Maintenance Manual* (Perkins part number SEBU8172-00), *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01), *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907), OR the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852).

Perkins 1100D Operation and Maintenance Manual	
Genie part number	123702
Perkins 1204 Operation and Maintenance Manual	
Genie part number	218726
Deutz TCD3.6 Operation Manual	
Genie part number	218707
John Deere 4045HF485 Operator's Manual	
Genie part number	123703

A-6
Perform Transmission Maintenance- All Models

Transmission specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Transmission oil level - check

Required maintenance procedures and additional Transmission information is available in the *Dana T20000 Maintenance Manual* (Dana part number 0202) or the *ZF 4 WG-98 TC Maintenance Manual* (ZF part number 5872 134 002).

Dana T20000 Maintenance Manual	
Genie part number	115025
ZF 4 WG-98 TC Operating Manual	
Genie part number	1258405

A-7
Perform 30 Day Service

The 30 day maintenance procedure is a one-time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:

John Deere models:

- A-9 Perform Engine Maintenance - John Deere Models
- B-5 Inspect the Tires, Wheels and Lug Nut Torque
- D-2 Replace the Hydraulic Tank Return Filter Element

Perkins and Deutz models:

- B-5 Inspect the Tires, Wheels and Lug Nut Torque
- D-2 Replace the Hydraulic Tank Return Filter Element

CHECKLIST A PROCEDURES

A-8
Perform Axle Maintenance

Axle specifications require that this procedure be performed every 50 hours or monthly, whichever comes first.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual
Genie part number 115026

A-9
Perform Engine Maintenance - John Deere Models

Engine specifications requires that this one-time procedure be performed after 100 hours of operation.

Required maintenance procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852)

John Deere 4045HF485 Operator's Manual
Genie part number 123703

A-10
Perform Axle Maintenance

Axle specifications require that this one-time procedure be performed after 100 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual
Genie part number 115026

A-11
Perform Axle Maintenance

Axle specifications requires that this procedure be performed every 200 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual
Genie part number 115026

Checklist B Procedures

B-1
Inspect the Battery

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Proper battery condition is essential to good engine performance and operational safety. Damaged cables and connections can result in engine component damage and hazardous conditions.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

1 Put on protective clothing and eye wear.

2 Be sure that the battery cable connections are free of corrosion.

Note: Adding terminal protectors and a corrosion preventative sealant will help eliminate corrosion on the battery terminals and cables.

3 Be sure that the battery hold-downs and cable connections are tight.

B-2
Inspect the Electrical Wiring

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Inspect the following areas for burnt, chafed, corroded and loose wires:

- Inside of the operator's compartment
- Inside of the chassis

2 Inspect for a liberal coating of dielectric grease in the following locations:

·All harness connectors

3 Start the engine and raise the boom so there is enough room to access and remove all the covers attached to the chassis.

4 Attach a lifting strap from an overhead crane to the boom. Support the boom. Do not apply any lifting pressure.

5 Remove all engine covers, tank covers and chassis covers.

⚠DANGER Crushing hazard. Death or serious injury could result if the boom should unexpectedly fall while working underneath the boom. Do not stand or work beneath a boom that is not properly supported.

6 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:

- Engine
- Transmission
- Manifolds
- Chassis

7 Inspect for a liberal coating of dielectric grease in all connections between the engine, transmission and the operator's compartment.

8 Install all covers removed in step 5.

9 Remove the lifting strap from the overhead crane.

10 Start the engine and lower the boom to the stowed position. Turn the machine off.

B-3
Check the Exhaust System

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining the exhaust system is essential to good engine performance and service life. Running the engine with a damaged or leaking exhaust system can cause component damage and unsafe operating conditions.

⚠WARNING Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Bodily injury hazard. Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Remove the center engine cover and set aside.

2 Open the right side engine access cover.

3 Be sure that all fasteners are tight.

4 Inspect all welds for cracks.

5 Inspect for exhaust leaks; i.e., carbon buildup around seams and joints.

6 Close the right side engine access cover. Install the center engine access cover.

CHECKLIST B PROCEDURES

B-4
Inspect the Engine Air Filter

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Maintaining the engine air filter in good condition is essential to good engine performance and service life. Failure to perform this procedure can lead to poor engine performance and component damage.

Note: Perform this procedure with the engine off.

1 Release the latches on the front cover of the air cleaner assembly. Remove the cover.

2 Gently twist and pull out the external or primary filter element.

3 Remove the inner or secondary filter element.

4 Clean the inside of the canister and the gasket with a damp cloth.

5 Inspect the primary and secondary air filter elements. If needed, blow from the inside out using low pressure dry compressed air, or carefully tap out dust.

6 Install the secondary filter element first, then install the primary filter element.

7 Install the front cover onto the air cleaner assembly and secure the latches.

B-5
Inspect the Tires, Wheels and Lug Nut Torque

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining the tires and wheels in good condition, including proper wheel fastener torque, is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

⚠WARNING Bodily injury hazard. An overinflated tire can explode and could result in death or serious injury.

⚠WARNING Tip over hazard. Do not use temporary flat tire repair products.

Note: The tires on some machines are foam filled and do not need air added to them.

1 Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.

2 Check each wheel for damage, bends and cracks.

3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.

Models with air-filled tires:

4 Put on protective clothing and eye wear.

5 Check the air pressure in the tire. Refer to Section 2, *Specifications*.

⊙ Result: The air pressure meets specification. The tire is at the correctly filled level.

⊠ Result: The air pressure does not meet specification. Add air until the air pressure meets specification.

6 Repeat this procedure beginning with step 5 for each remaining tire.

B-6
Perform Hydraulic Oil Analysis

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often. Refer to Section 2, *Specifications*.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.** See E-1, *Test or Replace the Hydraulic Oil.*

CHECKLIST B PROCEDURES

B-7
Inspect the Fuel and Hydraulic Tank Cap Venting Systems

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Free-breathing fuel and hydraulic tank caps are essential for good machine performance and service life. A dirty or clogged tank cap may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the caps be inspected more often.

⚠ DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

Note: Perform this procedure with the engine off.

1 Remove the cap from the fuel tank.

2 Check for proper venting.

⊙ Result: Air passes through the fuel tank cap. Proceed to step 4.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 3.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 2.

4 Install the fuel tank cap onto the fuel tank.

5 Remove the breather cap from the hydraulic tank.

6 Check for proper venting.

⊙ Result: Air passes through the fuel tank cap. Proceed to step 8.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 7.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

7 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 6.

8 Install the breather cap onto the hydraulic tank.

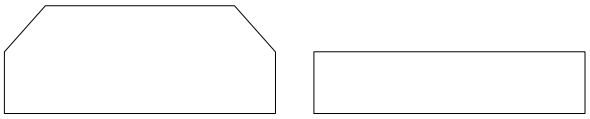
B-8
Check the Boom Wear Pads

Genie specifications require that this procedure be performed every 250 hours of operation.

1 Select a boom tube. Visually inspect both upper wear pads at the fork end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.



Wear Pad with wear indicator visible

Wear Pad with wear indicator not visible

2 Visually inspect both side wear pads at the fork end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.

3 Visually inspect each lower wear pad at the fork end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.

Note: Steps 4 through 6 do not apply for the large outside boom tube with external hard lines.

4 Visually inspect both upper wear pads at the pivot end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.

5 Visually inspect both side wear pad at the pivot end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.

6 Visually inspect both lower wear pads at the pivot end of the boom.

⊙ Result: Some of the wear indicator of both wear pads is visible. The wear pads are good.

⊠ Result: All of the wear indicator of one or both wear pads is not visible. Replace both wear pads. Refer to Repair Procedure 1-2, *How to Replace the Boom Wear Pads*.

7 Repeat this procedure, beginning with step 1, for each remaining boom tube.

CHECKLIST B PROCEDURES

B-9
Lubricate the Driveshafts

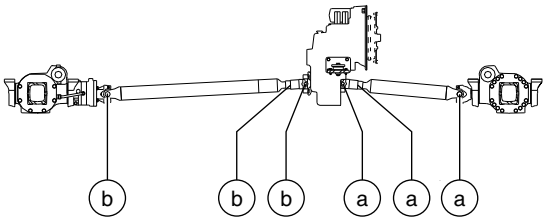
Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Greasing the specified locations is essential for good machine performance and service life. Operating the machine with little or no grease may cause the machine to perform poorly and continued use may cause component damage.

1 Using a grease gun, thoroughly grease the driveshafts at each of the locations indicated in the illustration.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent



a rear driveshaft
b front driveshaft

B-10
Perform Engine Maintenance - John Deere Models

Engine specifications require that this procedure be performed every 250 hours of operation.

Required maintenance procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852)

John Deere 4045HF485 Operator's Manual
Genie part number 123703

B-11
Perform Engine Maintenance - Deutz Models

Note: Engine specifications require that this procedure be performed every 250 hours.

Engine oil and filter - change

Engines with exhaust after-treatment system
Deutz DQC II LA approved oil
API CJ-4 low ash approved oil
Deutz DQC III LA approved oil in extreme conditions.

Engines without exhaust after-treatment system
Deutz DQC II LA approved oil
API CJ-4 low ash approved oil
Deutz DQC III approved oil in extreme conditions
Deutz DQC III LA approved oil in extreme conditions

Required maintenance procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907).

Deutz TCD3.6 Operation Manual	
Genie part number	218707

Checklist C Procedures

C-1
Perform Engine Maintenance - John Deere Models

Engine specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first.

Required maintenance procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852)

John Deere 4045HF485 Operator's Manual
Genie part number 123703

C-2
Perform Axle Maintenance

Axle specifications require that this procedure be performed after 500 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual
Genie part number 115026

CHECKLIST C PROCEDURES

C-3
Perform Transmission Maintenance - Dana Models

Transmission specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first.

Required maintenance procedures and additional transmission information is available in the *Dana T20000 Maintenance Manual* (Dana part number 0202).

Dana T20000 Maintenance Manual	
Genie part number	115025

C-4
Perform Engine Maintenance - Deutz Models

Note: Engine specifications require that this procedure be performed every 500 hours.

Coolant (additive concentration) - check
Intake pipes - check for damage
V-belts - check
Fuel pre-filter - clean (change insert if necessary)

Required maintenance procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907).

Deutz TCD3.6 Operation Manual	
Genie part number	218707

CHECKLIST C PROCEDURES

C-5
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 500 hours.

1104 Engine
V-belts - inspect/adjust/replace

1204 Engine
Engine oil and filter - change
API CJ-4 low ash approved oil
Fuel system primary filter (water separator) element - replace
Fuel system secondary filter - replace
Fan clearance - check

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual
Genie part number 117765

Perkins 1204 Operation and Maintenance Manual
Genie part number 218726

C-6
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 500 hours or annually.

1104 Engine
Engine oil and filter - change
API CH-4 or API CI-4 approved oil
Fuel system primary filter (water separator) element - replace
Fuel system secondary filter - replace
Crankcase breather (canister) - replace
Hoses and clamps - inspect/replace
Radiator - clean

1204 Engine
Radiator - clean

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual
Genie part number 117765

Perkins 1204 Operation and Maintenance Manual
Genie part number 218726

C-7
Inspect and Lubricate the Sequencing Chains

Genie specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first. In extremely dusty or hostile environments, it may be necessary to lubricate the chains more often.

Maintaining the sequencing chains in good condition is essential to safe operation and good machine performance. Failure to detect damage to the chains could result in a hazardous operating condition.

Environments in which Genie Telehandlers operate can vary widely from outdoor moisture and temperature extremes, to mildly corrosive or highly corrosive industrial atmospheres, in addition to abrasive exposures such as sand and grit.

In addition, dynamic shock loading can impose abnormal loads above the endurance limit of the chains. Examples of dynamic shock loading are:

- High velocity movement of load, followed by sudden abrupt stops.
- Carrying loads in suspension over irregular surfaces and rough terrain.
- Attempting to "inch" loads which are beyond the rated capacity of the vehicle.

The load cycles and environmental conditions make it impossible to predict chain life. It is therefore necessary to conduct regular inspections.

1 Park the machine on a firm level surface, level the boom and engage the parking brake.

2 Fully extend the boom.

3 Inspect the chains for the following conditions:

- **Elongation**
  BL866 chain - Measure 12 pitches of the extend chain for machines using BL866 chain.

Note: For identification, this chain typically measures one inch between pin centers when new.

BL666 chain - Measure 16 pitches of the extend chain for machines using BL666 chain.

Note: For identification, this chain typically measures 3/4 inch between pin centers when new.

Note: Both the extend and retract chains should be measured.

Note: Measurement should be taken in the area where the chain articulates most frequently over the sheaves.

⊙ Result: The distance measures 12.36 inches / 313mm or less. The chain is within specifications. Continue with inspection.

⊠ Result: If the distance is greater than 12.36 inches / 313mm, the machine shall be removed from service until the chain is replaced.

Note: The boom chain's normal life expectancy can be expressed as a maximum percent of elongation of 3%.

CHECKLIST C PROCEDURES

- **Edge wear**
  Check the chain for wear on the link plate edges caused by running back and forth over the sheave. The maximum reduction of material should not exceed 5%.
- **Cracked plates**
  Check link side plates for any cracks. These are generally a sign of chain fatigue.
- **Turning pins**
  Check the pins. The position of the riveting must be parallel with the top and bottom of the side plate.

If any of these conditions are discovered during the inspection, the chain must be replaced.

After inspection and before being returned to service, the chains must be lubricated with a quality chain lubricant.

Note: Do not use grease to lubricate chains.

The chain plates should be brushed with a wire brush prior to lubrication to clear the space between the plates.

The lubricant must penetrate the chain joint to prevent wear. Applying lubricant to the external surfaces will prevent rust, but the chains should be articulated to make sure the lubricant penetrates to the working surfaces between the pins and links.

Lubricant may be applied with a brush, sprayed or poured on, but the chain should be well flooded with lubricant and the boom should be extended and retracted to insure that the lubricant penetrates to the working surfaces. All excess lubricant should be wiped away from the external surfaces.

Note: Do not use solvents to remove excess lubricant.

C-8
Adjust the Boom Sequencing Chains

Note: Genie specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first.

1 Raise the boom to the horizontal position.

2 Extend the boom fully, then retract the boom approximately 1 inch / 25 mm.

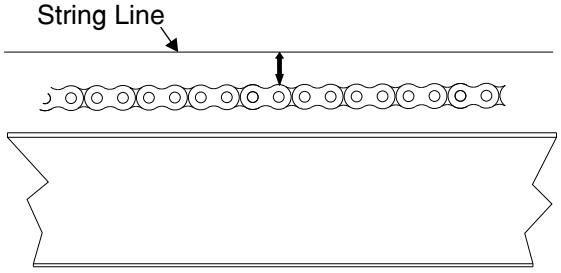
3 Tie a string line on each end of the chain, being sure to pull the string taut.

4 At the midpoint of the string, measure the distance between the string and the chain surface corresponding to the surface the string line is attached to.

⊙ Result: The distance is 0.25 to 0.5 inch / 6.35 to 12.7 mm. No adjustment to the chain is necessary. Proceed to step 8.

⊠ Result: The distance is less than a 0.25 inch / 6.35 mm OR is greater than 0.5 inch / 12.7 mm. The chain requires adjustment. Proceed to step 5.

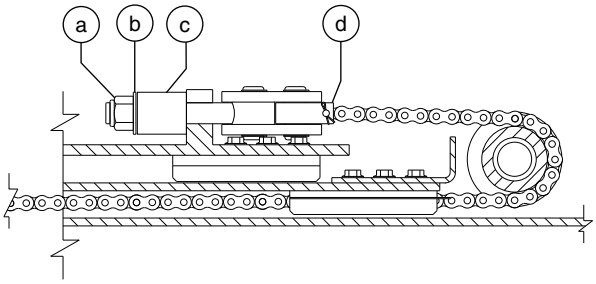
5 Working at the fork end of the large boom tube, locate the adjustable chain anchor on the top of the boom section.



6 Place an adjustable wrench across the flat part of the chain, just ahead of the chain anchor. Tighten the wrench onto the chain.

7 Using a 1 7/16 inch wrench, adjust the nut as required to tighten or loosen the chain. Repeat this procedure beginning with step 4 until the gap is between 0.25 to 0.5 inch / 6.35 to 12.7 mm.

Note: If the adjusting bolt runs out of threads before the chain tension is correct, the chain has stretched too far and the chain must be replaced.



a nut
b washer
c spacer
d chain anchor

8 Fully retract the boom.

9 Measure the gap between the washer and the spacer. The gap should be between 0.125 to 0.25 inch / 3.2 mm to 6.35 mm.

C-9
Perform Axle Maintenance

Axle specifications require that this procedure be performed every 700 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

CHECKLIST C PROCEDURES

C-10
Perform Axle Maintenance

Axle specifications require that this procedure be performed every 800 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

Checklist D Procedures

D-1
Inspect the Forks

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first OR whenever permanent deformation of the forks is suspected.

Maintaining the lifting forks in good condition is essential to safe operation and good machine performance. Failure to detect damage to the forks could result in a hazardous operating condition.

1 Thoroughly clean the lifting forks.

2 Inspect the forks for the following:

- Surface cracks
- Straightness of the blade and shank
- Fork angle at 90 ± 3 degrees
- Relative height of fork tips shall not differ more than 3% of blade length
- Excessive wear to the forks, fork mount or legible markings

Result: If any of the above criteria are not met, the fork shall be removed from service until it is repaired or replaced.

D-2
Replace Hydraulic Tank Return Filter Element

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first

Replacing the hydraulic return filter element is essential to good machine performance and service life. A dirty or clogged filter element may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter element be replaced more often.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

1 Start the engine. Retract the boom and lower the forks to the ground. Shut off the engine.

2 Open the hydraulic tank cover.

3 Remove the hydraulic tank filler cap.

4 Using a wrench, loosen the hydraulic tank return filter element cap.

5 Remove and properly discard the filter element.

Note: To reduce the amount of oil spilled, it may be helpful to drain the element into the tank during replacement.

6 Install the new filter element. Install and securely tighten the cap.

7 Clean up any oil that may have spilled.

CHECKLIST D PROCEDURES

D-3
Perform Transmission Maintenance- Dana Models

Transmission specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

Required maintenance procedures and additional transmission information is available in the *Dana T20000 Maintenance Manual* (Dana part number 0202).

Dana T20000 Maintenance Manual
Genie part number 115025

D-4
Perform Axle Maintenance

Axle specifications require that this procedure be performed every 1000 hours of operation.

Required maintenance procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 213 Axle Maintenance and Repair Manual
Genie part number 115026

D-5
Perform Engine Maintenance - Deutz Models

Note: Engine specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

Charge air cooler entry area - drain lube oil/ condensate
Cold starting device - check
Engine mounts - check
Hose clamps and hoses - check
V-rib belt and tensioning pulley - check
Fuel filter cartridge - replace
Filter insert for fuel pre-filter - replace

Required maintenance procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907).

Deutz TCD3.6 Operation Manual	
Genie part number	218707

D-6
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 1000 hours.

1104 Engine
Engine valve lash - inspect/adjust

1204 Engine
Water pump - inspect

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Perkins 1204 Operation and Maintenance Manual	
Genie part number	218726

CHECKLIST D PROCEDURES

D-7
Perform Transmission Maintenance- ZF Models

Transmission specifications require that this procedure be performed every 1500 hours.

Transmission oil and filter - change

Required maintenance procedures and additional transmission information is available in the *ZF 4 WG-98 TC Maintenance Manual* (ZF part number 5872 134 002).

ZF 4 WG-98 TC Operating Manual	
Genie part number	1258405

Checklist E Procedures

E-1
Test or Replace the Hydraulic Oil

Genie specifications require that this procedure be performed every 2000 hours or two years, whichever comes first

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more frequently. Refer to Section 2, *Specifications*.

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**

1 Lower the boom to the stowed position.

2 Remove the filler cap from the hydraulic tank.

3 Place a drain pan or other suitable container under the hydraulic tank. Refer to Section 2, *Specifications*.

4 Remove the drain plug from the hydraulic tank and completely drain the tank.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

5 Rinse out the inside of the tank using a mild solvent.

6 Install the drain plug and securely tighten. Do not over tighten.

7 Fill the tank with hydraulic oil until the fluid level is in the center of the sight glass at the rear of the tank.

8 Clean up any oil that may have spilled.

CHECKLIST E PROCEDURES

E-2
Perform Engine Maintenance - John Deere Models

Engine specifications require that this procedure be performed every 2000 hours or two years, whichever comes first.

Required maintenance procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852)

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

E-3
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 2000 hours.

1104 Engine
Aftercooler core - inspect
Alternator - inspect
Engine mounts - inspect
Starting Motor - inspect
Turbocharger - inspect
Water pump - inspect

1204 Engine
Aftercooler core - inspect
Engine mounts - inspect
Starting motor - inspect
Turbocharger - inspect

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Perkins 1204 Operation and Maintenance Manual	
Genie part number	218726

E-4
Perform Engine Maintenance - Deutz Models

Note: Engine specifications require that this procedure be performed every 3000 hours.

V-rib belt and tensioning pulley- replace

Required maintenance procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907).

Deutz TCD3.6 Operation Manual	
Genie part number	218707

E-5
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 3000 hours .

1104 Engine
Alternator Belt - Inspect/Adjust/Replace
Fuel Injector - test/change

1204 Engine
Alternator - inspect
Alternator and Fan Belts - replace
Diesel Particulate Filter - clean
Radiator Pressure Cap - clean/replace

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Perkins 1204 Operation and Maintenance Manual	
Genie part number	218726

CHECKLIST E PROCEDURES

E-6
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 4000 hours.

1204 Engine
Aftercooler Core - Clean/Test

Required maintenance procedures and additional engine information is available in the *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1204 Operation and Maintenance Manual
Genie part number 218726

E-7
Perform Engine Maintenance - John Deere Models

Engine specifications require that this procedure be performed every 4500 hours or 60 months, whichever comes first.

Required maintenance procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852)

John Deere 4045HF485 Operator's Manual
Genie part number 123703

E-8
Perform Engine Maintenance - Deutz Models

Note: Engine specifications require that this procedure be performed every 5000 hours.

General engine overhaul

Required maintenance procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907).

Deutz TCD3.6 Operation Manual	
Genie part number	218707

E-9
Perform Engine Maintenance - Perkins Models

Note: Engine specifications require that this procedure be performed every 12,000 hours or every three years, whichever comes first.

1104 and 1204 Engines
Cooling System Coolant
(Extended life coolant) - change

Required maintenance procedures and additional engine information is available in the *Perkins 1104 Operation and Maintenance Manual* (Perkins part number SEBU7833-01) OR the, *Perkins 1204 Operation and Maintenance Manual* (Perkins part number SEBU8605-01).

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Perkins 1204 Operation and Maintenance Manual	
Genie part number	218726

Repair Procedures

Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Use only Genie approved replacement parts.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Key switch in the off position with the key removed
  - Wheels chocked

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. Then to re-assemble, perform the disassembly steps in reverse order.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Note: Used to indicate additional operation or procedure information.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

Boom Components

1-1
Boom Proximity Switches

Both the boom angle proximity switch and the boom extend proximity switch are proximity switches. These switches function by sensing a change in the electromagnetic field of the switch, due to the introduction of metal into the field. A proximity switch is, simply, a metal detector.

The switch generates an electromagnetic field at the face of the switch. This field senses when steel has been moved close to the switch as well as when the steel has been moved away, which is how the switch contacts open and close.

These switches are of a fail-safe design. Should the switch or the switch wire circuit be faulty, the machine will not function outside its designed range of use.

The boom proximity switches are components of the drive circuit and the chassis sway circuit. Both the drive and the chassis sway functions are disabled when the boom is raised to 60° or higher and the boom is extended to greater than 43 feet / 13.1 m.

How to Test a Proximity Switch

1 Remove the switch from the machine. Do not disconnect the switch wire harness from the machine.

2 Start the engine.

3 Move the switch away from any ferrous or metallic object

⊙ Result: The light of the limit switch assembly is not illuminated.

4 Move the switch close to any ferrous or metallic object

⊙ Result: The light of the proximity switch assembly turns on. The switch is functioning correctly.

How to Adjust the Boom Angle Proximity Switch

The boom angle proximity switch is attached to a mounting bracket, located between the boom and the chassis directly beneath the boom pivot pin. The switch location is adjustable.

1 Start the engine.

2 Raise the boom to 60°. Confirm with a digital level.

3 Working at the pivot end of the boom, locate the boom angle proximity switch. Loosen the fasteners, securing the proximity switch assembly to the chassis, just enough to allow the bracket to move.

4 Move the proximity switch assembly until the light of the proximity switch turns on, then move the proximity switch assembly until the light of the proximity switch just turns off.

5 Securely tighten the fasteners. Do not over tighten.

6 Lower the machine to 55°.

⊙ Result: The light of the proximity switch assembly is illuminated.

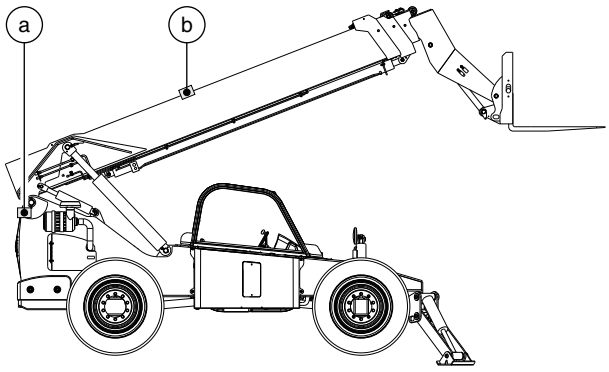
7 Raise the boom to 60°. Confirm with a digital level.

⊙ Result: The light of the proximity switch assembly is not illuminated. The proximity switch is properly calibrated.

⊠ Result: The light of the proximity switch assembly is illuminated. The proximity switch is not calibrated correctly. Repeat this procedure beginning with step 4.

How to Adjust the Boom Extend Proximity Switch

The boom extend proximity switch assembly, used only on the GTH-1056, is secured to the top surface of the number 0 boom tube at the center of the boom. The proximity switch assembly is fixed in position and is not adjustable.



a boom angle proximity switch
b boom extend proximity switch (GTH-1056)

BOOM COMPONENTS

1-2 Boom

How to Replace the Boom Wear Pads

1 **Lower wear pads:** Using a lifting strap from an overhead crane or a fork lift of sufficient capacity, lift the boom tube just enough to remove the weight from the pads.

2 Remove the wear pad mounting fasteners and remove the wear pads from the boom.

3 Lubricate the wear surface of the new pads. Refer to Maintenance Procedure A-4, *Lubricate the Boom*.

Note: Do not lubricate the side wear pads.

4 Install the wear pads. Install and securely tighten the fasteners. Do not over tighten.

How to Remove the Lifting Fork Frame

1 With the boom in the stowed position, attach a lifting strap from an overhead crane to the top of the lifting fork frame at the front of the boom. Support the frame. Do not apply any lifting pressure.

2 Working from the rear of the frame, lift the spring-assisted handle of the lock securing the lower fork frame lock pin to the fork frame mount. Use a soft metal drift to remove the pin.

3 Using the overhead crane, lift and remove the fork frame from the boom.

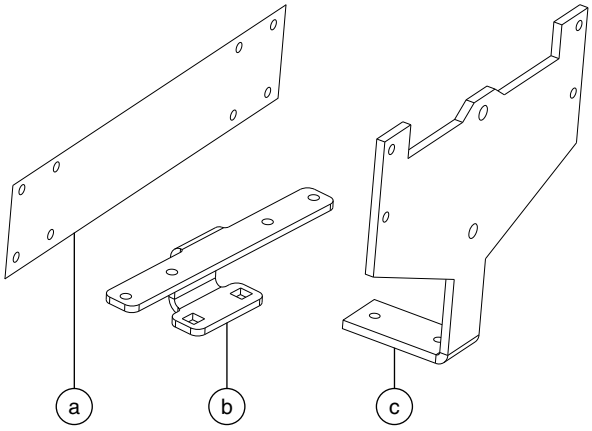
⚠CAUTION Crushing hazard. The fork frame could fall if not properly supported when the lock pin is removed from the machine.

How to Remove the Cable Bridge Assembly , GTH-1056

Inside the four-section boom of the GTH-1056, a cable bridge is used to route hydraulic lines through the boom assembly to the fork level cylinder and auxiliary connections (if equipped). The three-section boom on the GTH-1048 does not require the use of a cable bridge.

1 Remove the inspection cover at the pivot end of the boom.

2 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.



a cable bridge mount bracket
b cable track mount bracket
c cable bridge slider

3 Working at the pivot end of the boom, tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

4 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 1. Remove the hose roller assembly from the boom.

5 Working at the fork end of the boom, remove the fasteners securing the cable track mount bracket to boom tube number 3.

6 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

7 Working at the fork end of the boom, securely attach the loose end of the cable track to the cable bridge using a cable tie or similar device.

8 Working at the pivot end of the boom, carefully remove the cable bridge from the boom.

BOOM COMPONENTS

How to Replace the Retraction Chains

Note: Perform this procedure on a firm, level surface with the boom in the stowed position and the wheels chocked.

1 Start the engine and allow the engine to idle.

2 Raise the boom to a horizontal position.

3 Fully retract the boom.

4 Extend the boom approximately 1 inch / 2.5 cm.

5 Turn the machine off and remove the key from the key switch.

6 **GTH-1056:** Working at the fork end of the boom, loosen the fasteners securing the dual-chain tensioner to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioner free of the boom. Refer to Illustration 1.

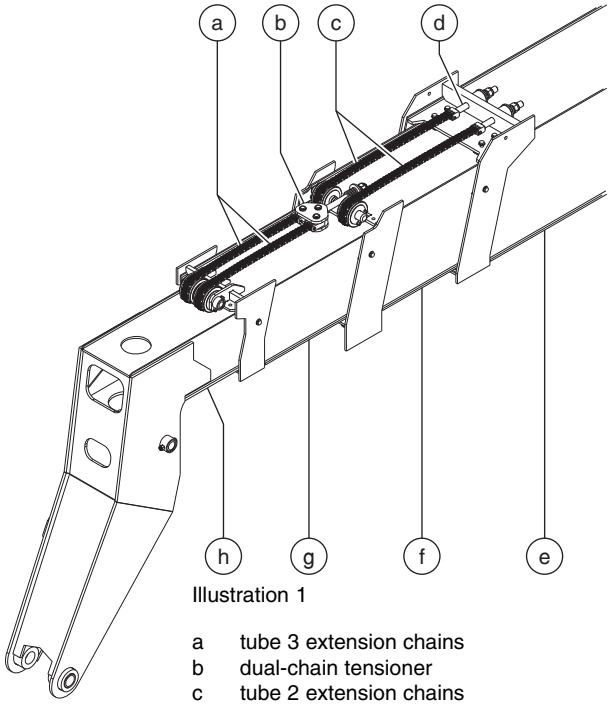


Illustration 1

a tube 3 extension chains
b dual-chain tensioner
c tube 2 extension chains
d single-chain tensioner
e boom tube number 0
f boom tube number 1
g boom tube number 2
h boom tube number 3

7 **GTH-1056:** Working at the fork end of the boom, loosen evenly the fasteners securing the single-chain tensioners to the top of boom tube number 0. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom. Refer to Illustration 1.

8 **GTH-1048:** Working at the fork end of the boom, loosen the fasteners securing the single-chain tensioners to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom. Refer to Illustration 2.

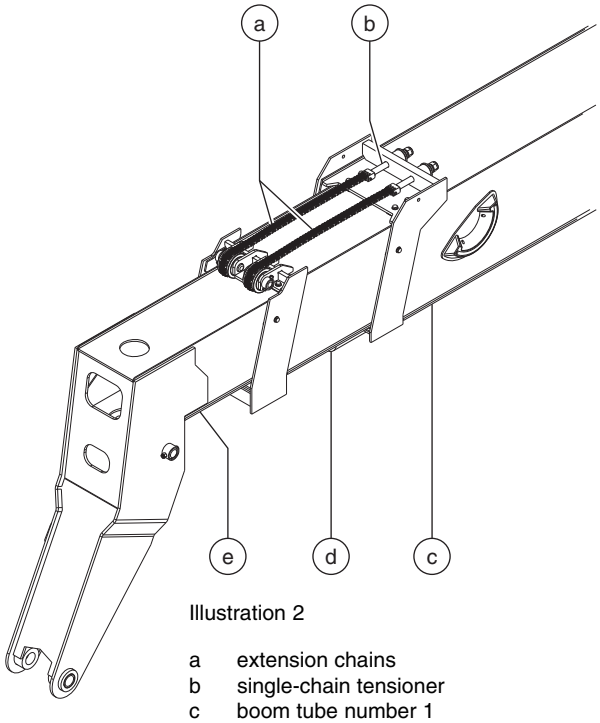


Illustration 2

a extension chains
b single-chain tensioner
c boom tube number 1
d boom tube number 2
e boom tube number 3

9 Remove the inspection cover from the pivot end of the boom.

10 **GTH-1056:** Locate the two chain anchors of the boom retraction chains where they attach to the chain anchor mount at the lower side of boom tube 2 and 3. Refer to Illustration 3.
GTH-1048: Locate the chain anchor of the boom retraction chain where it attaches to the chain anchor mount at the lower side of boom tube 3. Refer to Illustration 4.

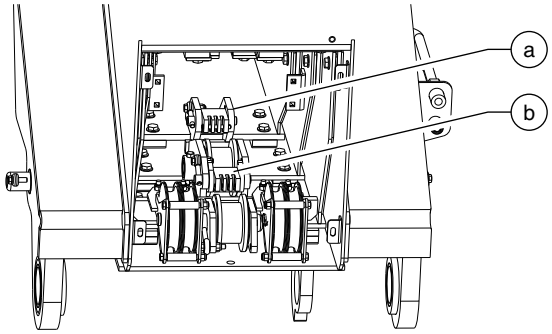


Illustration 3

a chain anchor - boom tube number 3
b chain anchor - boom tube number 2

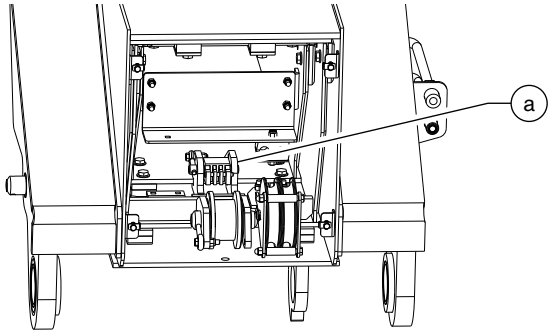


Illustration 4

a chain anchor

11 Select a chain anchor. Remove the fasteners securing the chain anchor pivot pin to the anchor mount of the boom tube. Remove the pivot pin and pull the chain anchor free of the mount.

12 Using a strap from an overhead crane, support the extend cylinder. Do not apply any lifting pressure

13 Working at the fork end of the boom, remove the fasteners securing the boom extend cylinder pivot pin to the boom.

14 Use a soft metal drift to remove the pivot pin. Lower the cylinder just enough for access to the chain anchor bolts.

15 Working at the fork end of the boom, securely connect a 30 foot / 10 m length of rope to the end of the chain. Securely tie off the other end of the rope to the boom structure.

16 Working at the pivot end of the boom, pull the chain out of the boom.

Note: Rope coming loose from the chain during removal may result in a difficult reassembly. Be sure the rope is securely attached to the chain and boom structure before pulling the chain out of the boom.

17 Remove the rope from the end of the chain and securely attach the rope to the new chain.

18 Working at the fork end of the boom, use the rope to carefully pull the chain through the boom just until the end of the chain is accessible. Remove the rope from the chain.

19 Working at the pivot end of the boom, install the chain anchor into the chain anchor mount. Secure the chain anchor to the mount using the pivot pin and fasteners removed in step 11. Securely tighten the fasteners. Do not over tighten.

BOOM COMPONENTS

20 Working at the pivot end of the boom, route the chain over the roller and install the chain onto the boom assembly using the pivot pin removed in step 11. Securely tighten the fasteners. Do not over tighten.

21 **GTH-1056:** Repeat this procedure, beginning with step 11, for the remaining chain anchor.

22 Install the inspection cover, removed in step 9, onto the boom. Install and securely tighten the fasteners. Do not over tighten.

23 **GTH-1056:** Working at the fork end of boom tube number 1, install the dual-chain tensioner into the tensioner mount. Install the mounting components, removed in step 6, and securely tighten the fasteners.

24 **GTH-1056:** Install the chain tensioners into the tensioner mount at the fork end of boom tube number 0. Install the mounting components, removed in step 7. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

25 **GTH-1048:** Install the chain tensioners into the tensioner mount at the fork end of boom tube number 1. Install the mounting components, removed in step 8. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

26 Adjust the chains. Refer to Maintenance Procedure D-2, *Adjust the Boom Sequencing Chains*.

NOTICE Component damage hazard. Chains can be damaged if the boom is used while the chains are out of adjustment. Do not return the machine to use until the chains have been correctly adjusted.

How to Replace the Extension Chains

Note: Perform this procedure on a firm, level surface with the boom in the stowed position and the wheels chocked.

1 Start the engine and allow the engine to idle.

2 Raise the boom to a horizontal position.

3 Fully retract the boom.

4 Turn the machine off and remove the key from the key switch.

5 **GTH-1056:** Working at the fork end of the boom, loosen the fasteners securing the dual-chain tensioner to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioner free of the boom. Refer to Illustration 1.

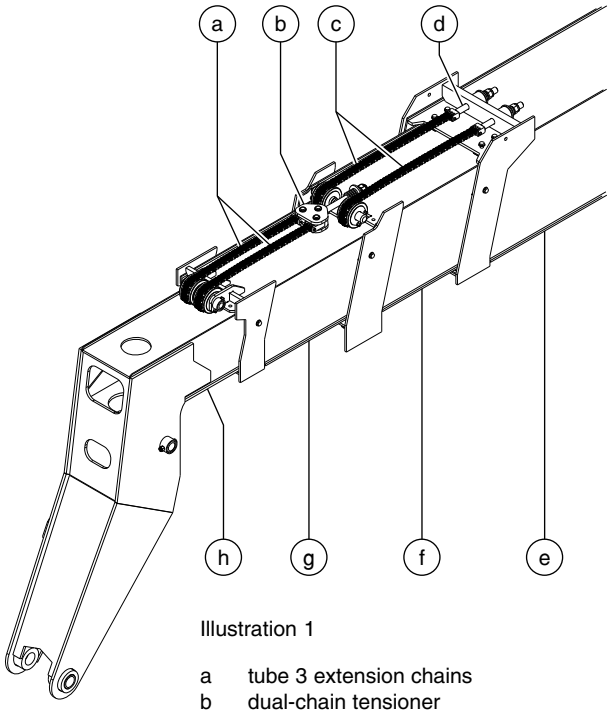


Illustration 1

a tube 3 extension chains
b dual-chain tensioner
c tube 2 extension chains
d single-chain tensioner
e boom tube number 0
f boom tube number 1
g boom tube number 2
h boom tube number 3

6 **GTH-1056:** Working at the fork end of the boom, loosen evenly the fasteners securing the single-chain tensioners to the top of boom tube number 0. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom. Refer to Illustration 1.

7 **GTH-1048:** Working at the fork end of the boom, loosen the fasteners securing the single-chain tensioners to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom. Refer to Illustration 2.

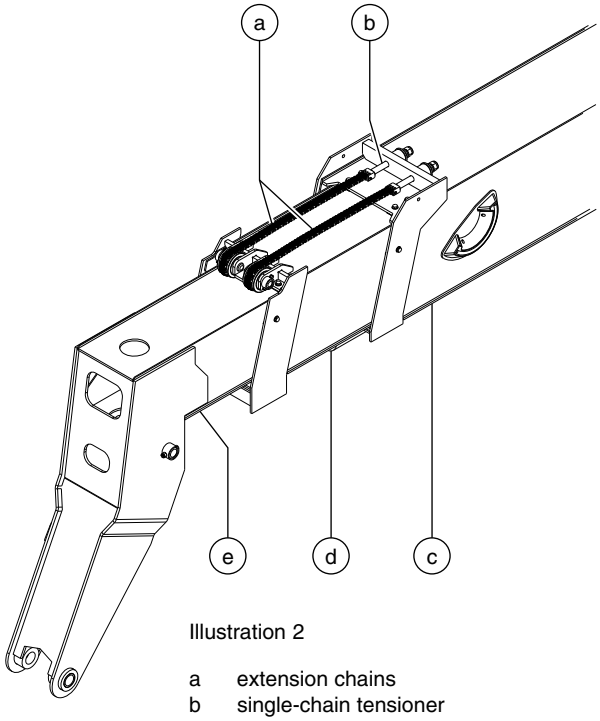


Illustration 2

a extension chains
b single-chain tensioner
c boom tube number 1
d boom tube number 2
e boom tube number 3

8 Select a chain tensioner. Remove the bow tie clip securing the chain anchor pin to the chain assembly. Remove the chain anchor pin from the assembly and remove the chain anchor from the tensioner assembly.

9 Repeat this procedure, beginning with step 8, for the other chains.

10 Working at the fork end of the boom, select a chain. Securely connect a 30 foot / 10 m length of rope to the end of the chain. Securely tie off the other end of the rope to the boom structure.

11 **GTH-1056:** Remove the inspection cover from the pivot end of the boom and locate the chain anchors of the extension chains at the top of boom tubes 2 and 3.
GTH-1048: Remove the inspection cover from the pivot end of the boom and locate the chain anchors of the extension chains at the top of boom tube 3.

12 Remove the fasteners securing the extension chain anchors to the boom tubes.

13 Working at the pivot end of the boom, pull the chain out of the boom.

Note: Rope coming loose from the chain during removal may result in a difficult reassembly. Be sure the rope is securely attached to the chain and boom structure before pulling the chain out of the boom.

14 On a workbench, remove the bow tie clip securing the chain anchor pin to the chain assembly. Remove the pin and chain anchor pin from the assembly.

BOOM COMPONENTS

15 Install the chain anchor, pin and clip onto the new chain.

16 Remove the rope from the end of the old chain and securely attach the rope to the new chain.

17 Working at the fork end of the boom, use the rope to carefully pull the chain through the boom just until the end of the chain is accessible.

18 Working at the pivot end of the boom and using the fasteners removed in step 12, install the chain anchor onto the boom tube. Securely tighten the fasteners. Do not over tighten.

19 Remove the rope from the chain and install the chain into the chain anchor of the tensioner assembly. Secure the chain to the chain anchor using the pin and clip removed in step 8.

20 Repeat this procedure, beginning with step 10, for the other chains.

21 Install the inspection cover, removed in step 8, onto the boom. Install and securely tighten the fasteners. Do not over tighten.

22 **GTH-1056:** Working at the fork end of boom tube number 1, install the dual-chain tensioner into the tensioner mount. Install the mounting components, removed in step 5, and securely tighten the fasteners.

23 **GTH-1056:** Install the chain tensioners into the tensioner mount at the fork end of boom tube number 0. Install the mounting components, removed in step 6. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

24 **GTH-1048:** Install the chain tensioners into the tensioner mount at the fork end of boom tube number 1. Install the mounting components, removed in step 7. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

25 Adjust the chains. Refer to Maintenance Procedure D-2, *Adjust the Boom Sequencing Chains*.

NOTICE Component damage hazard. Chains can be damaged if the boom is used while the chains are out of adjustment. Do not return the machine to use until the chains have been correctly adjusted.

How to Remove the Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the lifting fork and frame. See 1-2, *How to Remove the Lifting Fork Frame*.

2 Attach a lifting strap from an overhead 10 ton / 10,000 kg crane to the fork end of the boom. Support the boom. Do not apply any lifting pressure.

3 Select a fork level cylinder. Remove the fasteners securing the fork level cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from another overhead crane, support the rod-end of the fork level cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the fork level cylinder pivot pin.

6 Lower the fork level cylinder onto the chassis.

⚠WARNING Crushing hazard. Keep hands clear of the cylinder manifold when lowering the cylinder.

7 Repeat this procedure beginning with step 3 for the other fork level cylinder.

8 Select a lift cylinder. Tag, disconnect and plug the hydraulic hoses at the lift cylinder manifold. Cap the fittings on the cylinder manifold.

9 Remove the fasteners securing the lift cylinder barrel-end pivot pin to the chassis.

10 Support and secure the barrel end of the lift cylinder to the boom.

11 Use a soft metal drift to remove the lift cylinder pivot pin.

12 Repeat this procedure beginning with step 8 for the other lift cylinder.

13 Tag, disconnect and plug the hydraulic hoses at the hydraulic hard line connections at the pivot end of the boom. Cap the fittings.

14 Using the overhead crane, raise the boom to a horizontal position.

⚠WARNING Crushing hazard. The lift cylinders will fall if not properly supported when the boom is raised.

15 Remove the fasteners securing the boom pivot pin to the chassis.

16 Use a soft metal drift to remove the boom pivot pin.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

17 Carefully remove the boom assembly from the machine and place it on a structure capable of supporting it.

⚠DANGER Crushing hazard. The boom could become unbalanced and fall if not properly supported when removed from the machine.

NOTICE Component damage hazard. The weight of the boom assembly may crush the hydraulic hard lines under the boom. Use caution when placing the boom assembly onto a structure capable of supporting it.

BOOM COMPONENTS

How to Disassemble the Boom, GTH-1048

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the extension cylinder. See 1-4, *How to Remove the Extension Cylinder*.

2 Remove the boom. See 1-2, *How to Remove the Boom*.

3 Select a lift cylinder. Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from an overhead crane, support the lift cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the lift cylinder rod-end pivot pin. Remove the cylinder from the boom.

⚠WARNING Crushing hazard. The cylinder could become unbalanced and fall if not properly supported when removed from the machine.

6 Repeat this procedure beginning with step 3 for the other lift cylinder.

7 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

8 Use a soft metal drift to remove the rod-end pivot pin.

9 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

10 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched

11 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

12 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the boom.

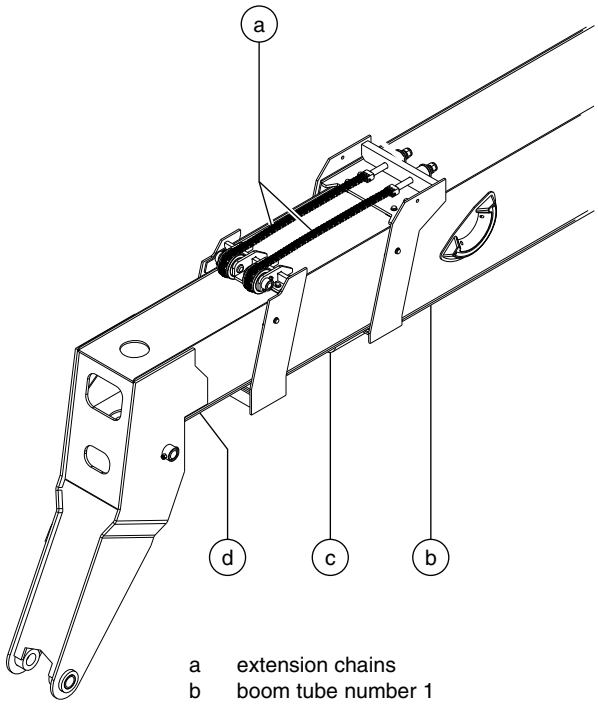
⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

13 Remove the inspection cover at the pivot end of the boom.

14 Remove the hose keepers from the hose roller assembly.

Note: The hose keepers ensure that the hoses do not jump off the hose rollers.

BOOM COMPONENTS



a extension chains
b boom tube number 1
c boom tube number 2
d boom tube number 3

15 Working at the pivot end of the boom, remove the clamps securing the hoses to the inside of boom tube number 3.

16 Working at the fork end of the boom, remove the clamps securing the hoses to the inside of boom tube number 3.

17 Working at the pivot end of the boom, pull the fork level hydraulic hoses from the boom and lay them to the side.

18 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 2. Remove the hose roller assembly from the boom.

19 Working at the fork end of the boom, loosen evenly, then remove, the fasteners securing the chain tensioners to the top of boom tube number 1.

20 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 2. Remove the chain rollers from the boom.

21 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 3. Remove the pivot pin. Remove the chain from the roller.

22 Working at the pivot end of the boom, remove the fasteners securing the retraction chain roller to boom tube number 2. Remove the chain roller from the boom.

23 Working at the fork end of the boom, remove the wear pads from boom tube number 2.

24 Support and slide boom tube number 3 out of boom tube number 2. Place boom tube number 3 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 3 could become unbalanced and fall when removed from the boom tube number 2 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

25 Working at the fork end of the boom, remove the wear pads from boom tube number 1.

26 Support and slide boom tube number 2 out of boom tube number 1. Place boom tube number 2 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 2 could become unbalanced and fall when removed from the boom tube number 1 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

BOOM COMPONENTS

How to Disassemble the Boom, GTH-1056

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the extension cylinder. See 1-4, *How to Remove the Extension Cylinder*.

2 Remove the boom. See 1-2, *How to Remove the Boom*.

3 Select a lift cylinder. Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from an overhead crane, support the lift cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the lift cylinder rod-end pivot pin. Remove the cylinder from the boom.

⚠WARNING Crushing hazard. The cylinder could become unbalanced and fall if not properly supported when removed from the machine.

6 Repeat this procedure beginning with step 3 for the other lift cylinder.

7 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

8 Use a soft metal drift to remove the rod-end pivot pin.

9 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

10 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched

11 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

12 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

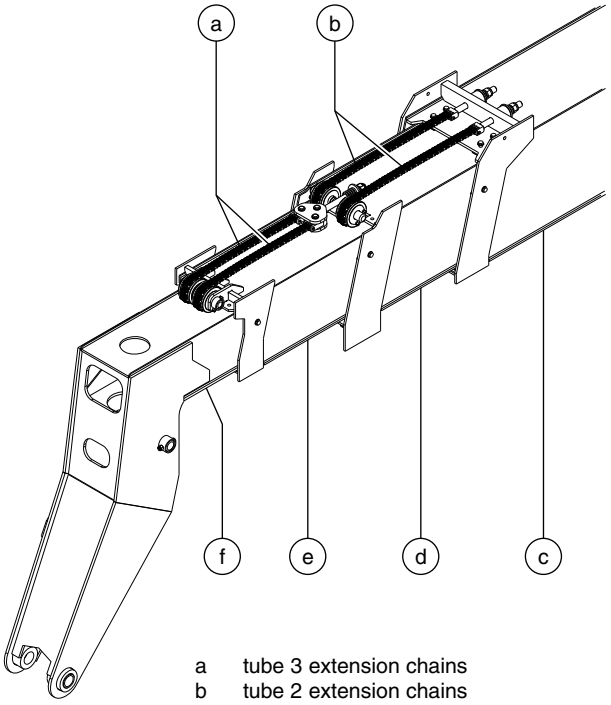
⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

13 Remove the inspection cover at the pivot end of the boom.

14 Working at the pivot end of the boom, remove the hose keepers from the hose roller assembly.

Note: The hose keepers ensure that the hoses do not jump off the hose rollers.

BOOM COMPONENTS



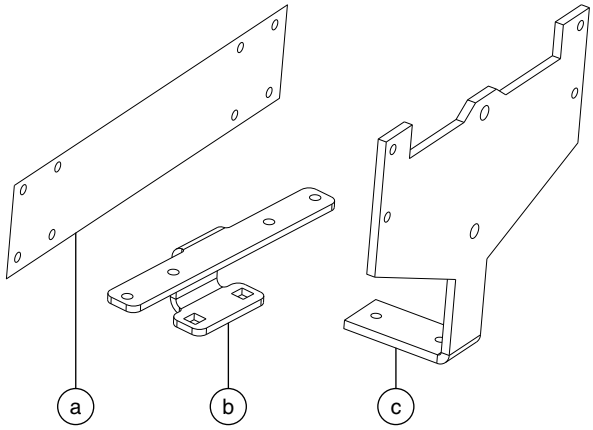
a tube 3 extension chains
b tube 2 extension chains
c boom tube number 0
d boom tube number 1
e boom tube number 2
f boom tube number 3

15 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

16 Working at the pivot end of the boom, tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

17 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 1. Remove the hose roller assembly from the boom.

18 Working at the fork end of the boom, remove the fasteners securing the cable track mount bracket to boom tube number 3.



a cable bridge mount bracket
b cable track mount bracket
c cable bridge slider

19 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

20 Working at the fork end of the boom, securely attach the loose end of the cable track to the cable bridge using a cable tie or similar device.

21 Working at the pivot end of the boom, carefully remove the cable bridge from the boom.

22 Working at the fork end of the boom, remove the fasteners securing the dual-chain tensioner to the top of boom tube number 1.

23 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 2. Remove the chain rollers from the boom.

BOOM COMPONENTS

24 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 3. Remove the pivot pin.

25 Working at the fork end of the boom, remove the wear pads from boom tube number 2.

26 Support and slide boom tube number 3 out of boom tube number 2. Place boom tube number 3 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 3 could become unbalanced and fall when removed from the boom tube number 2 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

27 Working at the fork end of the boom, loosen evenly, then remove, the fasteners securing the chain tensioners to the top of boom tube number 0.

28 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 1. Remove the chain rollers from the boom.

29 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 2. Remove the pivot pin.

30 Working at the pivot end of the boom, remove the fasteners securing the chain roller to boom tube number 2. Remove the chain roller from the boom.

31 Working at the fork end of the boom, remove the wear pads from boom tube number 1.

32 Support and slide boom tube number 2 out of boom tube number 1. Place boom tube number 2 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 2 could become unbalanced and fall when removed from the boom tube number 1 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

33 Working at the pivot end of the boom, remove the fasteners securing the chain roller to boom tube number 1. Remove the chain roller from the boom.

34 Working at the fork end of the boom, remove the wear pads from boom tube number 0.

35 Support and slide boom tube number 1 out of boom tube number 0. Place boom tube number 1 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 1 could become unbalanced and fall when removed from the boom tube number 0 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

1-3
Boom Lift Cylinder

How to Remove a Lift Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Attach a lifting strap from an overhead 10 ton / 10,000 kg crane to the fork end of the boom. Support the boom. Do not apply any lifting pressure.

2 Tag, disconnect and plug the hydraulic hoses at the lift cylinder manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the rod end of the lift cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the lift cylinder barrel-end pivot pin to the chassis.

5 Use a soft metal drift to remove the pivot pin.

6 Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

8 Using the overhead crane, raise the boom to a horizontal position. Remove the cylinder from the machine.

⚠DANGER Crushing hazard. The cylinder will fall if not properly supported when removed from the machine.

BOOM COMPONENTS

1-4
Boom Extension Cylinder

How to Remove the Extension Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the boom to a horizontal position.

2 Tag, disconnect and plug the hydraulic hoses at the boom extension cylinder manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the center point of the boom extension cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the extension cylinder support loop from the underside of the boom.

Note: The extension cylinder support loop is located at the fork end of the boom.

5 Remove the fasteners securing the extension cylinder pivot pins to the boom.

6 Use a soft metal drift to remove both pivot pins. Remove the cylinder from the machine.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pins are removed from the machine.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

1-5
Fork Level Cylinder

How to Remove the Fork Level Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the lifting fork frame. See 1-2, *How to Remove the Lifting Fork Frame*.

2 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

3 Use a soft metal drift to remove the pivot pin.

4 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

5 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched

6 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

BOOM COMPONENTS

How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1048

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Tag, disconnect and plug the fork level cylinder supply hoses at the cylinder manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

6 Working near the center of the boom assembly, tag, disconnect and plug the hydraulic hoses from the hydraulic hard lines under boom tube number number 1. Cap the hard lines.

7 Securely connect a 30 feet / 10 m length of rope to each end of the hoses disconnected in steps 5 and 6. Securely tie off the other end of each section of rope to the boom structure.

8 Working at the pivot end of the boom, select one of the hoses. Pull the hose out of the boom.

Note: Rope coming loose from either end of the hose or the boom during hose removal may result in a difficult reassembly. Be sure each section of rope is securely attached to both the hose and the boom structure before pulling the hose out of the boom.

9 Remove the rope from each end of the hose. Discard the hose.

10 Securely install a section of rope onto each end of the new hose assembly.

11 Install the new hose assembly into the boom in the same manner the hose was removed. Using the rope, carefully pull the hose through the boom until each end is accessible.

12 Install both ends of the hose assembly onto the correct connection points. Torque to specification. Refer to Section 2, *Specifications*.

13 Repeat this procedure for the remaining hose to be replaced, beginning with step 8.

14 Remove the lifting strap from the fork frame.

15 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1056

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Replace the lower hoses:

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

6 Tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Working near the center of the boom assembly, tag, disconnect and plug the hydraulic hoses from the hydraulic hard lines under boom tube number number 1. Cap the hard lines.

8 Securely connect a 30 feet / 10 m length of rope to the end of each hose disconnected in steps 6 and 7. Securely tie off the other end of each section of rope to the boom structure.

9 Working at the pivot end of the boom, select one of the hoses. Pull the hose out of the boom.

Note: Rope coming loose from either end of the hose or the boom during hose removal may result in a difficult reassembly. Be sure each section of rope is securely attached to both the hose and the boom structure before pulling the hose out of the boom.

10 Remove the rope from the hose. Discard the hose.

11 Securely install a section of rope onto the correct end of the new hose assembly.

12 Install the new hose assembly into the boom by routing the hose under the roller at the pivot end of the boom. Using the rope, carefully pull the hose through the boom until the end is accessible.

13 Install both ends of the hose assembly onto the correct connection points. Torque to specification. Refer to Section 2, *Specifications*.

14 Repeat this procedure for the remaining hose to be replaced, beginning with step 8.

15 Install the cable bridge rear mount bracket onto the cable bridge and the boom assembly. Securely tighten the fasteners. Do not over tighten.

16 Remove the lifting strap from the fork frame.

17 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

BOOM COMPONENTS

Replace the upper hoses:

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

6 Tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Return the cable bridge to its original position.

8 Working at the fork end of the boom, tag, disconnect and plug the fork level cylinder hoses at the cylinder manifolds. Cap the fittings.

9 **Models with auxiliary function:** Working at the fork end of the boom, tag, disconnect and plug the auxiliary hoses at the fittings. Cap the fittings.

10 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

11 Remove the fasteners securing the cable track to the cable track mount bracket.

12 Remove the fasteners securing the cable track mount bracket to the cable bridge. Remove the bracket from the boom.

13 Carefully pull the cable track through the opening at the front of boom until the hose connections are accessible.

14 Tag, disconnect and plug the affected hoses. Cap the fitting. Remove the hose from the cable track.

15 Install the new hose assembly and torque to specification. Refer to Section 2, *Specifications*.

16 Install the cable bridge and cable track into the boom.

17 Install the cable track mount bracket and cable bridge slider. Securely tighten all fasteners. Do not over tighten.

18 Working at the pivot end of the boom, install the hydraulic hoses onto the hard lines of the cable bridge and torque to specification. Refer to Section 2, *Specifications*.

19 Install the cable bridge mount bracket onto the cable bridge and the boom assembly. Securely tighten all fasteners. Do not over tighten.

20 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

Operator's Compartment

2-1
Operator's Compartment

How to Remove the Operator's Compartment

The operator's compartment is used to activate machine functions while sitting in the operator's drivers seat.

Within the operator's compartment there is a transmission column shifter, steering selector, 4-way controller, accelerator pedal, brake pedal and a differential lock switch. All of these components are replaceable.

For further information or assistance, consult the Genie Industries Service Department.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Locate the secondary function manifold under the manifold inspection cover. Tag, disconnect and plug the hydraulic hoses at ports BP and BT of the secondary function manifold. Cap the fittings. See 7-3, *Secondary Function Manifold Components*.

4 Locate the brake manifold under the manifold inspection cover. Tag, disconnect and plug the hydraulic hose at the underside of the brake manifold. Cap the fitting. See 7-6, *Brake Manifold Components*.

5 Working under the dashboard, locate the hydraulic hose at port L of the steering orbitral.

6 Working at the front axle, locate the hydraulic hose connected to the front axle steer cylinder at the operator's compartment side of the machine. Tag, disconnect and plug the hydraulic hose. Cap the fitting.

7 Tag, disconnect and plug the hydraulic hoses at ports SUP, SUR and SUT of the secondary function manifold. Cap the fitting.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

8 Tag, disconnect and plug the hydraulic hose at port SULS of the primary function manifold. Cap the fitting.

9 Tag, disconnect and plug the hydraulic hose at port JP of the secondary function manifold. Cap the fitting.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

OPERATOR'S COMPARTMENT

10 Tag, disconnect and plug the hydraulic hoses at ports J1, J2, J3 and J4 of the primary function manifold. Cap the fittings.

11 **Models with dual joystick:** Tag, disconnect and plug the hydraulic hoses at ports JT2, JT4, JS3 and JS1 of the primary function manifold. Cap the fittings.

12 Remove the fasteners securing the joystick mount to the operator's compartment. Remove the joystick assembly.

13 **Models with single joystick:** With the base of the joystick above the top of the hydraulic tank, tag disconnect and plug the hydraulic hose at port T of the joystick. Cap the fitting.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the joystick if the joystick is below the hydraulic oil level in the hydraulic tank.

14 **Models with dual joystick:** Locate the tee fitting which joins together the hydraulic hoses from port T of both joysticks to the tank return hydraulic hose.

15 **Models with dual joystick:** With the tee fitting above the top of the hydraulic tank, tag, disconnect and plug the tank return hydraulic hose from the tee fitting. Cap the fitting.

Note: Removing the hydraulic hose from the tee fitting with the tee fitting below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the tee fitting if the tee fitting is below the hydraulic oil level in the hydraulic tank.

16 Working inside the chassis, tag and disconnect the wire harnesses at the connectors next to the operator's compartment.

17 Support and secure the operator's compartment to an adjustable table capable of supporting the weight and that will allow the operator's compartment to remain in an upright and stable position.

NOTICE Component damage hazard. Wrapping a strap around the cab and lifting using an overhead crane can put excessive pressure on the glass windows of the cab, causing the windows to break. Do not lift the cab using a strap from an overhead crane if the strap contacts the windows.

Note: Placing a wedge between the operator's compartment and the adjustable table may be required to keep the operator's compartment stable.

18 Remove the lower fasteners securing the operator's compartment to the chassis.

19 Remove the upper fasteners securing the operator's compartment to the chassis.

⚠WARNING Crushing hazard. The operator's compartment will fall if not properly supported when the fasteners are removed from the machine.

20 Slowly move the operator's compartment away from the chassis while feeding all loose hoses, cables and wires through the opening of the chassis.

NOTICE Component damage hazard. Hoses, cables and wires can be damaged if they are kinked or pinched.

Bolt torque specification	
Operator's cab mounting bolts	750 ft-lbs 1017 Nm

2-2
Machine Controls

How to Remove the Steering Column

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the fasteners securing the transmission control lever to the column. Carefully separate the lever from the column.

4 Remove the nut securing the key switch to the dash panel. Gently push the key switch through the opening.

5 Remove the fasteners securing the dash panel to the dashboard.

6 Carefully pull the dash panel towards the seat of the operator's compartment.

7 Tag and disconnect the wire harness from the componments of the dash panel. Remove the dash panel from the machine.

8 Loosen the two lower fasteners securing the dash frame to the operator's compartment.

9 Remove the two upper fasteners securing the dash frame to the operator's compartment.

10 Rotate the dash frame towards the seat of the operator's compartment.Remove the dashboard from the machine.

11 Tag and disconnect the ground wire of the steer column.

12 Support and secure the steer orbitral to the dash frame.

13 Remove the fasteners securing the steer column and steer orbitral to the dash frame.

14 Lower the steer orbitral and remove the steer column from the machine.

How to Remove the Steering Wheel

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the horn button from the steering wheel. Remove the nut securing the steering wheel to the column and remove the steering wheel.

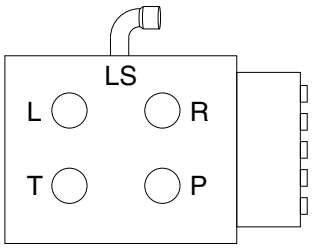
OPERATOR'S COMPARTMENT

How to Remove the Steer Orbitral

1 Remove the steering column. See 2-2, *How to Remove the Steering Column*.

2 Working under the dashboard, locate the hydraulic hose at port L of the steering orbitral.

3 Follow the hydraulic hose from port L of the steer orbitral to its connection at the front axle of the machine. Tag, disconnect and plug the hydraulic hose at the front axle. Cap the fitting.



4 Tag, disconnect and plug the hydraulic hoses at ports SUP, SUR and SUT of the secondary function manifold. Cap the fitting.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Tag, disconnect and plug the hydraulic hose at port SULS of the primary function manifold. Cap the fitting.

6 Slowly move the steer orbitral away from the dash frame while feeding all loose hoses through the opening of the chassis.

How to Remove the Joystick - Models with Single Joystick

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

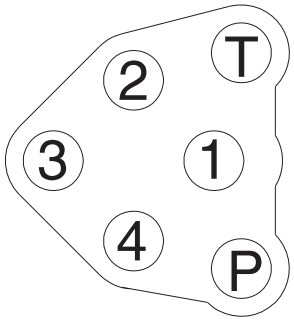
3 Remove the fasteners securing the joystick mount panel to the side console.

4 Tag and disconnect the joystick wire harness from the machine.

5 Tag, disconnect and plug the hoses from ports 1, 2, 3, 4, P and T of the joystick. Cap the fittings.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the port if the joystick is below the hydraulic oil level in the hydraulic tank.

6 Remove the fasteners securing the joystick to the mount panel. Remove the joystick.



Joystick port orientation

How to Remove the Joystick - Models with Dual Joysticks

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the fasteners securing the joystick mount panel to the side console.

4 Tag and disconnect the joystick wire harness from the machine.

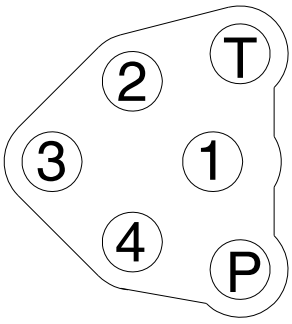
5 Tag, disconnect and plug the hoses from ports 1, 2, 3, 4 and P of the joystick. Cap the fittings.

6 Locate the tee fitting which joins together the hydraulic hoses from port T of both joysticks to the tank return hydraulic hose.

7 With the tee fitting above the top of the hydraulic tank, tag, disconnect and plug the tank return hydraulic hose from the tee fitting. Cap the fitting.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the port if the joystick is below the hydraulic oil level in the hydraulic tank.

8 Remove the fasteners securing the joystick to the mount panel. Remove the joystick.



Joystick port orientation

How to Remove the Brake Pedal Assembly

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Fully press and release the brake pedal a minimum of 10 times to release the hydraulic pressure in the brake system.

4 Tag, disconnect and plug the hydraulic hoses at ports BP and BT of the secondary hydraulic manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Follow the hydraulic hose from port A of the brake pedal manifold to the brake manifold. Tag, disconnect and plug this hydraulic hose at the brake manifold. Cap the fitting.

6 Remove the fasteners securing the brake pedal assembly to the dash frame.

7 Gentley rotate the brake pedal in an upwards direction and slowly move the brake pedal assembly away from the dash frame while feeding all loose hoses through the opening of the chassis.

OPERATOR'S COMPARTMENT

How to Remove the Dash Cluster Assembly

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the fasteners securing the transmission control lever to the column. Carefully separate the lever from the column.

4 Reach under the dashboard and gently push the dash cluster through the opening in the dashboard.

5 Tag and disconnect the wire harness from the dash cluster. Remove the dash cluster from the machine.

How to Remove the Diagnostic Display

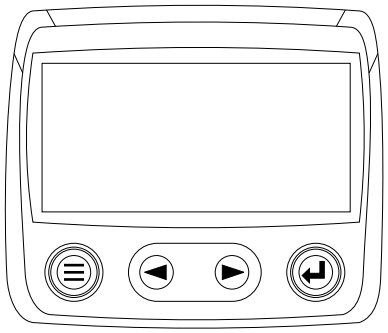
1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Reach under the dashboard and gently loosen and remove the locknut securing the diagnostic display to the dashboard. Gently push the diagnostic display through the opening in the dashboard.

4 Tag and disconnect the wire harness from the diagnostic display. Remove the diagnostic display from the machine.



Fuel and Hydraulic Tank

3-1
Fuel and Hydraulic Tank

How to Remove the Fuel and Hydraulic Tank Assembly

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Remove the fuel tank in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

⚠DANGER Explosion and fire hazard. Never drain or store fuel in an open container due to the possibility of fire.

⚠DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the battery from the machine.

4 Tag and disconnect the wire harness from the fuel level terminals.

5 Remove the filler cap from the hydraulic tank.

6 Place a drain pan or other suitable container under the hydraulic tank. Refer to Section 2, *Specifications*.

7 Remove the drain plug from the hydraulic tank and completely drain the tank.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

8 Remove the filler cap from the fuel tank.

9 Using an approved hand-operated pump, drain the fuel tank into a container of suitable capacity. Refer to Section 2, *Specifications*.

⚠DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

Note: Be sure to only use a hand operated pump suitable for use with gasoline and/or diesel fuel.

10 Tag, disconnect and plug the fuel supply and return hoses. Cap the fittings.

11 Tag, disconnect and plug the supply and return hoses from the hydraulic tank. Cap the fittings.

12 Support and secure the tank assembly to an appropriate lifting device.

13 Remove the fasteners securing the tank assembly to the chassis. Remove the tank from the machine.

⚠WARNING Crushing hazard. The tank assembly could become unbalanced and fall if not properly supported when removed from the machine.

Engines

4-1
Engines

How to Repair the John Deere 4045T Engine

Repair procedures and additional engine information is available in the *John Deere 4045HF485 Operator's Manual* (John Deere part number OMRG36852) and the *John Deere 4045T Workshop Manual* (John Deere part number CTM104) and the *John Deere 4045T Alternator Manual* (John Deere part number CTM77) and the *John Deere 4045T Fuel Systems Manual* (John Deere part number CTM207).

John Deere 4045HF485 Operator's Manual	
Genie part number	123703
John Deere 4045T Workshop Manual	
Genie part number	108443
John Deere 4045T Alternator Manual	
Genie part number	108502
John Deere 4045T Fuel Systems Manual	
Genie part number	108503

How to Repair the Perkins 1104D-E44TA Engine

Repair procedures and additional engine information is available in the *Perkins 1100 Operation and Maintenance Manual* (Perkins part number SEBU8172-00) and the *Perkins 1104 Service Manual* (Perkins part number RENR9401) and the *Perkins 1100 Troubleshooting Manual* (Perkins part number SENR9982-01).

Perkins 1100 Operation and Maintenance Manual	
Genie part number	123702
Perkins 1104 Service Manual	
Genie part number	117764
Perkins 1100 Troubleshooting Manual	
Genie part number	123583

How to Repair the Deutz TD3.6 L4 and TCD3.6 L4 Engines

Repair procedures and additional engine information is available in the *Deutz TCD3.6 Operation Manual* (Deutz part number 0312 3907) and the *Deutz TD3.6 L4 and TCD3.6 L4 Workshop Manual* (Deutz part number 0312 3965en).

Deutz TCD3.6 Operation Manual	
Genie part number	218707
Deutz TD3.6 and TCD3.6 Workshop Manual	
Genie part number	1251788

How to Remove the Engine

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the fasteners securing the engine access cover from the rear of the machine. Remove the cover from the machine.

4 **Perkins models:** Open the engine access cover at the tank side of the machine. Locate the fuel supply line where it is attached to the fuel filter/water separator.

5 **Perkins models:** Tag, disconnect and plug the fuel supply hose at the fuel filter/water separator. Cap the fitting.

6 **Perkins models:** Locate the fuel return hose connection just above the fuel filter/water separator.

7 **Perkins models:** Tag, disconnect and plug the fuel return hose at the fuel filter/water separator. Cap the fitting.

8 **John Deere models:** Open the engine access cover at the tank side of the machine. Locate the fuel supply line where it is attached to the fuel filter/water separator.

9 **John Deere models:** Tag, disconnect and plug the fuel supply hose at the fuel filter/water separator. Cap the fitting.

10 **John Deere models:** Open the engine access cover at the operator's compartment side of the machine. Locate the fuel return hose at the fuel pump.

11 **John Deere models:** Tag, disconnect and plug the fuel return hose at the fuel pump. Cap the fitting.

12 Open the transmission access cover at the top of the machine. Locate the transmission cooler.

13 Tag, disconnect and plug the coolant hoses at the transmission cooler. Cap the fittings.

14 Tag and disconnect the engine wire harnesses near the operator's compartment.

15 Remove the air cleaner from the machine. Remove all intake and exhaust components which would interfere with the removal of the engine from the chassis.

16 Remove the fasteners securing the driveshaft to the transmission. Secure the bearing caps onto the universal joint of the driveshaft.

Note: Using adhesive tape to secure the caps to the universal joint may be helpful.

17 Remove the fasteners securing the engine tray to the chassis.

18 Support and secure the engine tray to a forklift of adequate capacity.

19 Remove the engine tray from the machine.

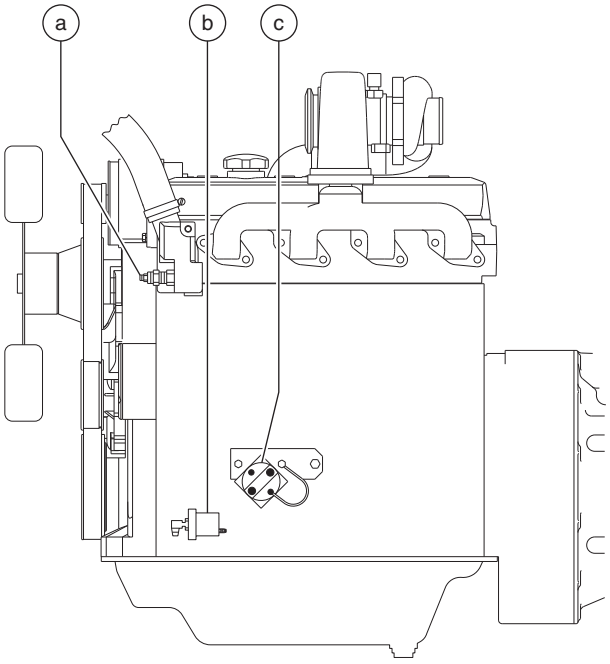
ENGINES

4-2
Engine Fault Codes

How to Retrieve Engine Fault Codes

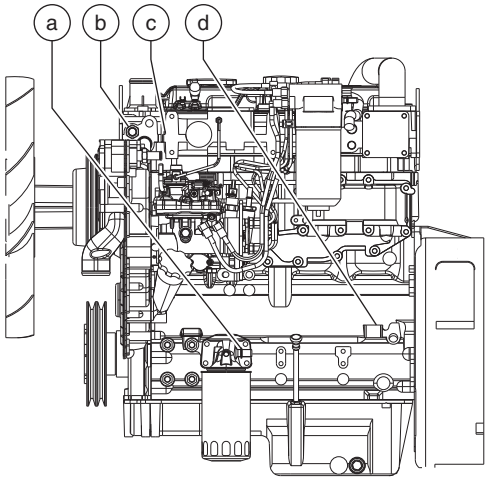
When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory. At the same time, a colored warning lamp is illuminated and the fault code is shown on the engine diagnostic display, is located on the dashboard in the operator's compartment.

To learn the specifics of and how to use the fault codes, refer to Section 5, *Fault Codes*.



John Deere 4045HF485 engine

a coolant temperature sender
b oil pressure sender
c starter relay



Perkins 1104D-E44TA engine

a oil pressure sensor
b coolant temperature sender
c intake temperature sensor
d crank speed sensor

Transmission

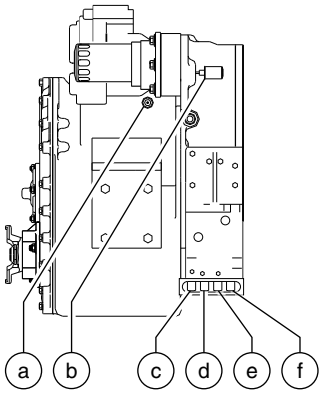
5-1 Transmission

How to Repair the Transmission

Repair procedures and additional transmission information is available in the *Dana T12000 Transmission Maintenance and Repair Manual* (Dana part number 0109) and the *Dana T20000 Maintenance Manual* (Dana part number 0202).

Dana T12000 Transmission Manual	
Genie part number	97489

Dana T20000 Maintenance Manual	
Genie part number	115025



Dana T20000 transmission
- a transmission temperature sender (located opposite side of trans)
- b transmission pressure sender
- c transmission shift coil 'F' (drive forward function) (blue wire)
- d transmission shift coil 'R' (drive reverse function) (brown wire)
- e transmission shift coil '2' (gear reduction) (green wire)
- f transmission shift coil '1' (gear reduction) (yellow wire)

Note: refer to electrical schematic for additional transmission shift coil information.

How to Remove the Transmission

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Place a drain pan or other suitable container under the hydraulic tank. Refer to Section 2, *Specifications*.

4 Remove the drain plug from the hydraulic tank and completely drain the tank.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

5 Tag, disconnect and plug the transmission oil cooler lines at the cooler. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are

TRANSMISSION

kinked or pinched.

6 Tag, disconnect and plug the hydraulic pump high pressure line at the function manifold. Cap the fitting.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Tag, disconnect and plug the hydraulic pump supply line at the pump. Cap the orifice on the pump.

8 Remove the fasteners securing the transmission mounting flange to the chassis.

9 Tag and disconnect the driveshafts from the transmission.

Note: To avoid damage to the driveshaft universal joints, secure the driveshafts to the chassis.

10 Tag and disconnect the wiring harness from the transmission.

11 Attach a lifting strap from an overhead crane to the center point of the transmission.

12 Remove the fasteners securing the transmission mounting flange to the chassis. Remove the transmission from the machine.

⚠DANGER Crushing hazard. The transmission will fall if not properly supported when removed from the machine.

Hydraulic Pump

6-1
Hydraulic Pump

How to Test the Function Pump

Note: When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Tag, disconnect and plug the high pressure hydraulic hose from the primary function manifold. Cap the fitting on the main valve.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Note: The high pressure hose is the smaller of the two hoses.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the high pressure hose disconnected in step 1.

3 Hold the manual fuel shut-off lever on the engine in the closed position.

4 Observe the pressure gauge while cranking the engine in one second intervals.

⊙ Result: If the pressure gauge reads 3190 psi / 220 bar, immediately stop. The pump is good.

⊠ Result: If the pressure fails to reach 3190 psi / 220 bar, the pump needs to be adjusted OR or the pump or pump coupling is faulty and will need to be serviced or replaced.

NOTICE Component damage hazard. There is no relief valve in the hydraulic pump and the pump can be damaged if the pressure is allowed to exceed specification. When testing the pump, crank the engine in one second intervals until the correct pressure is confirmed. Do not over-pressurize the pump.

5 Remove the pressure gauge and install the high pressure hose onto the pump. Torque to specification. Refer to Section 2, *Specifications*.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

HYDRAULIC PUMP

How to Remove the Function Pump

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Note: Perform this procedure with the engine off and cool.

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Tag and disconnect the wire harness from the pump.

4 Tag and disconnect the case drain hose at the top of the pump. Cap the fitting on the pump.

Note: Placing the open end of the case drain hose below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the case drain hose to below the fluid level of the hydraulic tank until the hose is plugged.

5 Tag, disconnect and plug the large hydraulic pump supply hose at the pump. Cap the fitting on the pump.

Note: Placing the open end of the pump supply hose below the fluid level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the pump supply hose to below the fluid level of the hydraulic tank until the hose is plugged.

6 Tag, disconnect and plug the high pressure hose at the pump. Cap the fitting on the pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

7 Tag and disconnect the transmission cooler hoses at the transmission cooler. Cap the fittings.

⚠CAUTION Burn hazard. Contact with hot engine components may cause severe burns.

8 Remove the fasteners securing the pump to the transmission. Remove the pump from the machine.

How to Install the Function Pump

1 Carefully install the hydraulic pump onto the transmission. Install the fasteners and tighten to finger tight.

2 Torque the fasteners evenly to 85 ft-lbs / 115 Nm.

3 Install the smaller high pressure hose onto the pump outlet. Torque the fasteners to 27-37 ft-lbs / 37-50 Nm.

4 Install the larger low pressure hose onto the pump outlet. Install the hose retaining rings and fasteners. Torque the fasteners to 55-66 ft-lbs / 74-90 Nm.

5 Working at the case drain at the top of the pump, fill the pump with hydraulic fluid until the fluid is at the top of the case drain fitting.

6 Install the case drain hose onto the pump and torque to specification. Refer to Section 2, *Specifications*.

7 Securely install the wire harness onto the pump.

8 Check the level of the hydraulic fluid in the hydraulic tank. Add fluid if needed.

9 Prime the pump. See 6-1, *How to Prime the Function Pump.*

10 Start the engine and inspect for leaks.

11 Turn the machine off.

12 Adjust the pump pressure. See 6-1, *How to Adjust the Function Pump Standby Pressure* and *How to Adjust the Function Pump Pressure Pressure Compensator.*

HYDRAULIC PUMP

How to Prime the Function Pump

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

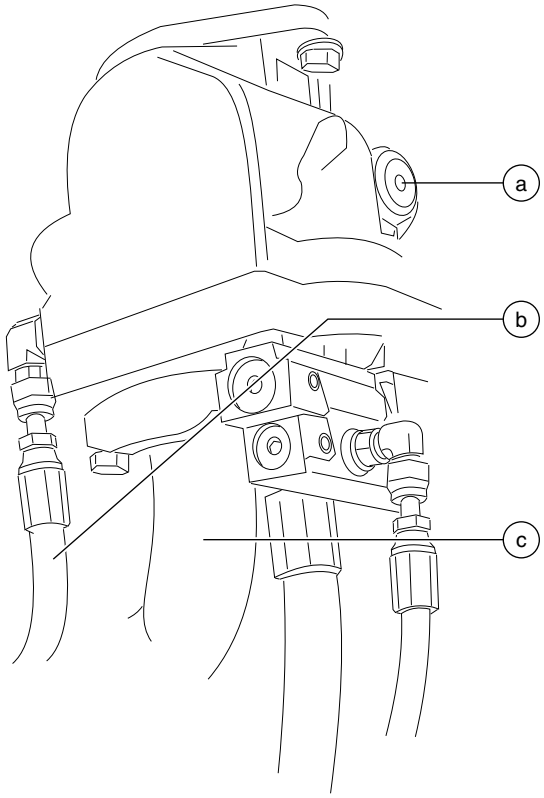
1 Install all hoses onto the hydraulic pump. Torque to specification. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

2 Locate the case drain filler plug at the side of the function pump.

3 Remove the plug and slowly fill the case drain port of the pump with hydraulic fluid until the oil level is even with the bottom of the hole. Install the plug and torque to 40 ft-lbs / 54 Nm.

4 Start the engine, allow the engine to run at low idle for 15 seconds then shut off the engine. Wait 15 seconds, then start the engine again. Allow the engine to run at low idle for 15 seconds and then shut off the engine.

5 Check for hydraulic leaks and clean up any oil that may have spilled.



a case drain filler plug
b case drain hose
c hydraulic supply line (from tank)

How to Adjust the Function Pump Standby Pressure

1 Connect a 0 to 1000 psi / 0 to 100 bar pressure gauge to test port 'TP' on the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine and allow the engine to run at low idle.

3 Observe the pressure reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly. Proceed to step 6.

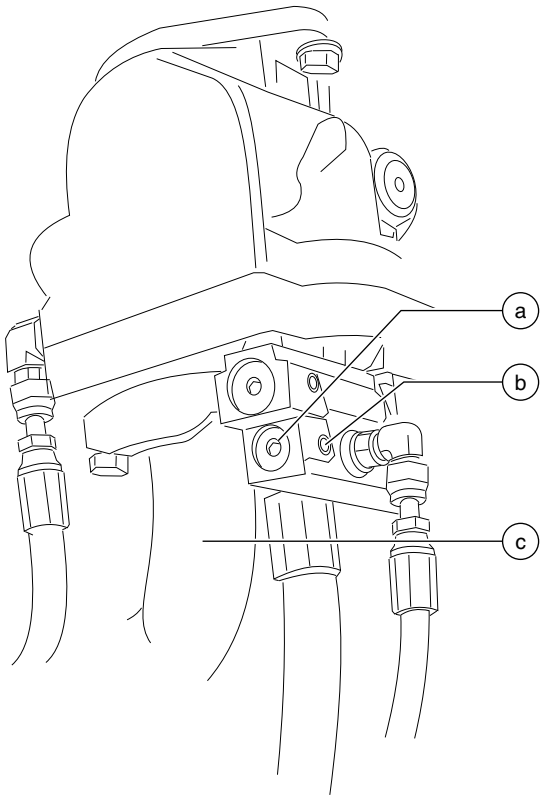
⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Proceed to step 4.

4 Loosen the set screw for the standby pressure adjustment screw.

5 Adjust the function pump standby pressure. Turn the adjustment screw clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the set screw.

6 Turn the engine off and remove the pressure gauge.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.



a standby pressure adjustment screw
b set screw
c hydraulic supply line (from tank)

HYDRAULIC PUMP

How to Adjust the Function Pump Pressure Compensator

Note: Two people will be required to perform this procedure.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to test port 'TP' on the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine and allow the engine to run at low idle.

3 Fully retract the boom.

4 Continue to activate the boom retract function and observe the pressure reading on the pressure gauge.

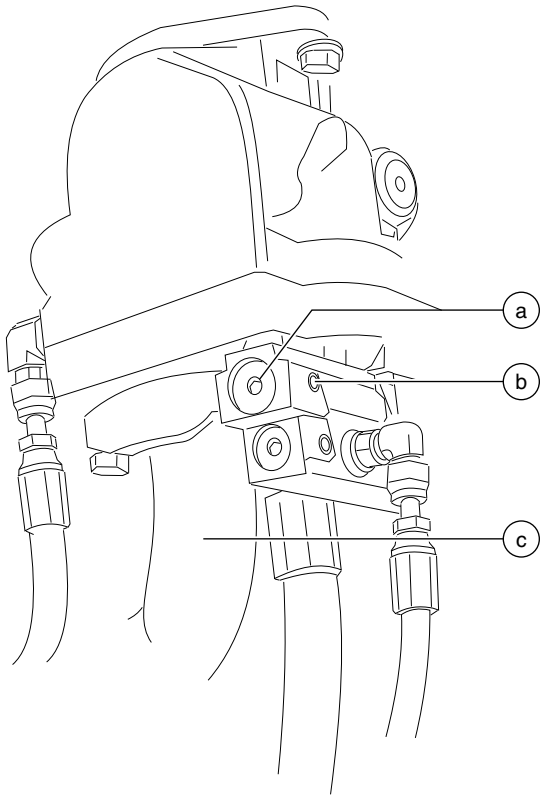
⊙ Result: The pressure gauge reads 3190±50 psi / 220±3.4 bar. The pump is functioning correctly. Proceed to step 7.

⊠ Result: The pressure gauge fails to read 3190±50 psi / 220±3.4 bar. The pressure setting needs to be adjusted. Proceed to step 5.

5 Loosen the set screw for the pressure compensator adjustment screw.

6 Adjust the pressure compensator pressure. Turn the adjustment screw clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the set screw.

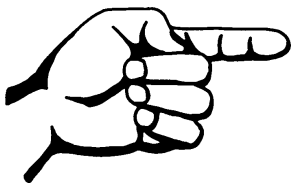
NOTICE Component damage hazard. Do not adjust the pressure compensator higher than specified.



a pressure compensator adjustment screw
b set screw
c hydraulic supply line (from tank)

7 Turn the engine off and remove the pressure gauge.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.



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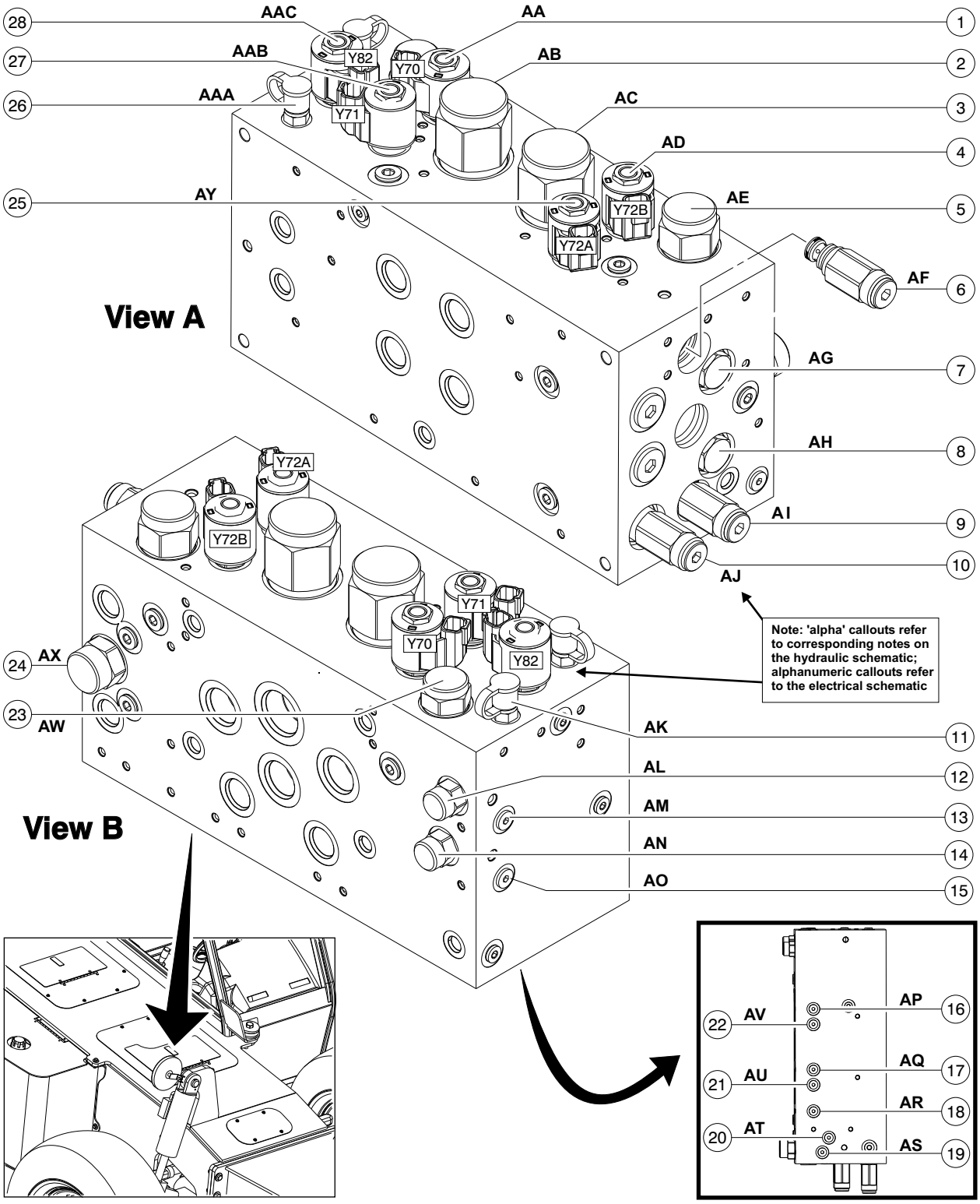
Manifolds

7-1
Primary Function Manifold Components - Models with Single Joystick

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 4 way	AA	Function select - boom extend and sway left	20 ft-lbs / 27 Nm
2	Directional valve, 3 position 4 way, pilot operated	AB	Boom extend/retract	65-75 ft-lbs / 88-101 Nm
3	Directional valve, 3 position 4 way, pilot operated	AC	Boom up/down	65-75 ft-lbs / 88-101 Nm
4	Solenoid valve, 2 position 4 way	AD	Function select - boom down and fork tilt down	20 ft-lbs / 27 Nm
5	Directional valve, 3 position 4 way, pilot operated	AE	Fork tilt up/down	46-54 ft-lbs / 61-72 Nm
6	Relief valve, 3500 psi / 241 bar	AF	Fork tilt up relief	20 ft-lbs / 27 Nm
7	Check valve, pilot operated 100 psi / 6.9 bar	AG	Fork tilt down circuit	25 ft-lbs / 34 Nm
8	Check valve, pilot operated 100 psi / 6.9 bar	AH	Fork tilt up circuit	25 ft-lbs / 34 Nm
9	Relief valve, 3500 psi / 241 bar	AI	Fork tilt down relief	20 ft-lbs / 27 Nm
10	Relief valve, 3500 psi / 241 bar	AJ	System relief	25 ft-lbs / 34 Nm
11	Diagnostic nipple	AK	Test port 'LS'	
12	Flow regulator valve, 0.1 gpm / 0.4 L/min	AL	Load sense drain circuit	20 ft-lbs / 27 Nm
13	Check valve, 5 psi / 0.3 bar	AM	Sway right circuit	12-14 ft-lbs / 16-19 Nm
14	Priority flow regulator valve, 2 gpm / 7.6 L/min	AN	Sway left/right circuit	20 ft-lbs / 27 Nm
15	Check valve, 5 psi / 0.3 bar	AO	Sway left circuit	12-14 ft-lbs / 16-19 Nm

MANIFOLDS

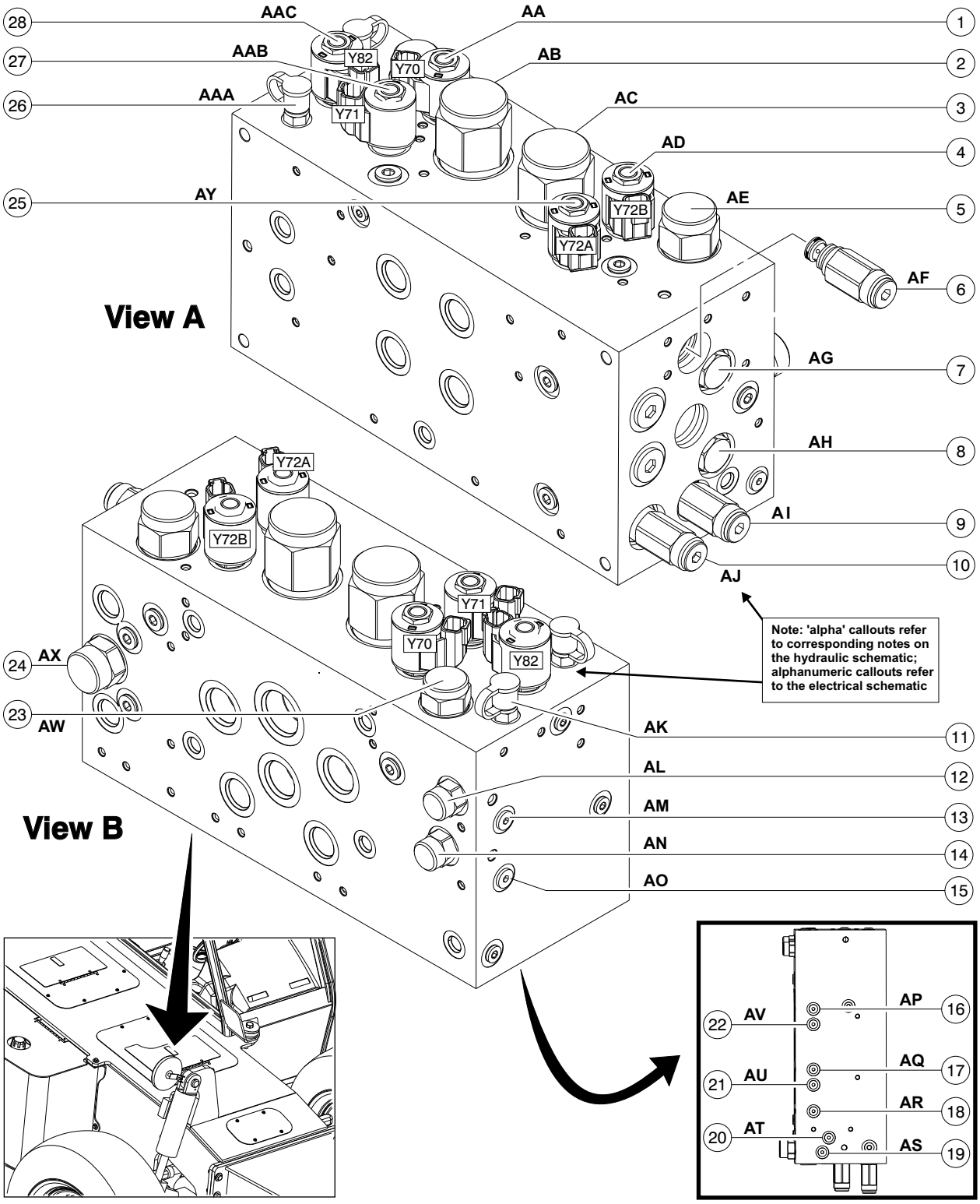

28
AAC
AA
1
27
AAB
Y82
Y70
AB
2
26
AAA
Y71
AC
3
AD
4
25
AY
Y72B
AE
5
Y72A
AF
6
View A
AG
7
AH
8
Y72A
AI
9
Y72B
10
AJ
Y71
Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic
Y70
Y82
24
AX
23
AW
AK
11
AL
12
View B
AM
13
AN
14
AO
15
22
AV
AP
16
AQ
21
AU
17
AR
18
20
AT
AS
19

MANIFOLDS

Primary Function Manifold Components - Models with Single Joystick, continued

16	Check valve, 5 psi / 0.3 bar	AP	Boom extend circuit	12-14 ft-lbs / 16-19 Nm
17	Check valve, 5 psi / 0.3 bar	AQ	Boom down circuit	12-14 ft-lbs / 16-19 Nm
18	Check valve, 5 psi / 0.3 bar	AR	Fork tilt up circuit	12-14 ft-lbs / 16-19 Nm
19	Check valve, 5 psi / 0.3 bar	AS	Steer left/right circuit	12-14 ft-lbs / 16-19 Nm
20	Check valve, 5 psi / 0.3 bar	AT	Fork tilt down circuit	12-14 ft-lbs / 16-19 Nm
21	Check valve, 5 psi / 0.3 bar	AU	Boom up circuit	12-14 ft-lbs / 16-19 Nm
22	Check valve, 5 psi / 0.3 bar	AV	Boom retract circuit	12-14 ft-lbs / 16-19 Nm
23	Directional valve, 3 position 4 way, pilot operated	AW	Sway left/right	33-37 ft-lbs / 45-50 Nm
24	Flow regulator valve, 14 gpm / 53 L/min	AX	Fork tilt up/down circuit	20 ft-lbs / 27 Nm
25	Solenoid valve, 2 position 4 way	AY	Function select - boom up and fork tilt up	20 ft-lbs / 27 Nm
26	Diagnostic nipple	AAA	Test port 'TP'	
27	Solenoid valve, 2 position 4 way	AAB	Function select - boom extend and sway right	20 ft-lbs / 27 Nm
28	Solenoid valve, 2 position 2 way	AAC	Function select - sway left/right	20 ft-lbs / 27 Nm

MANIFOLDS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Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic

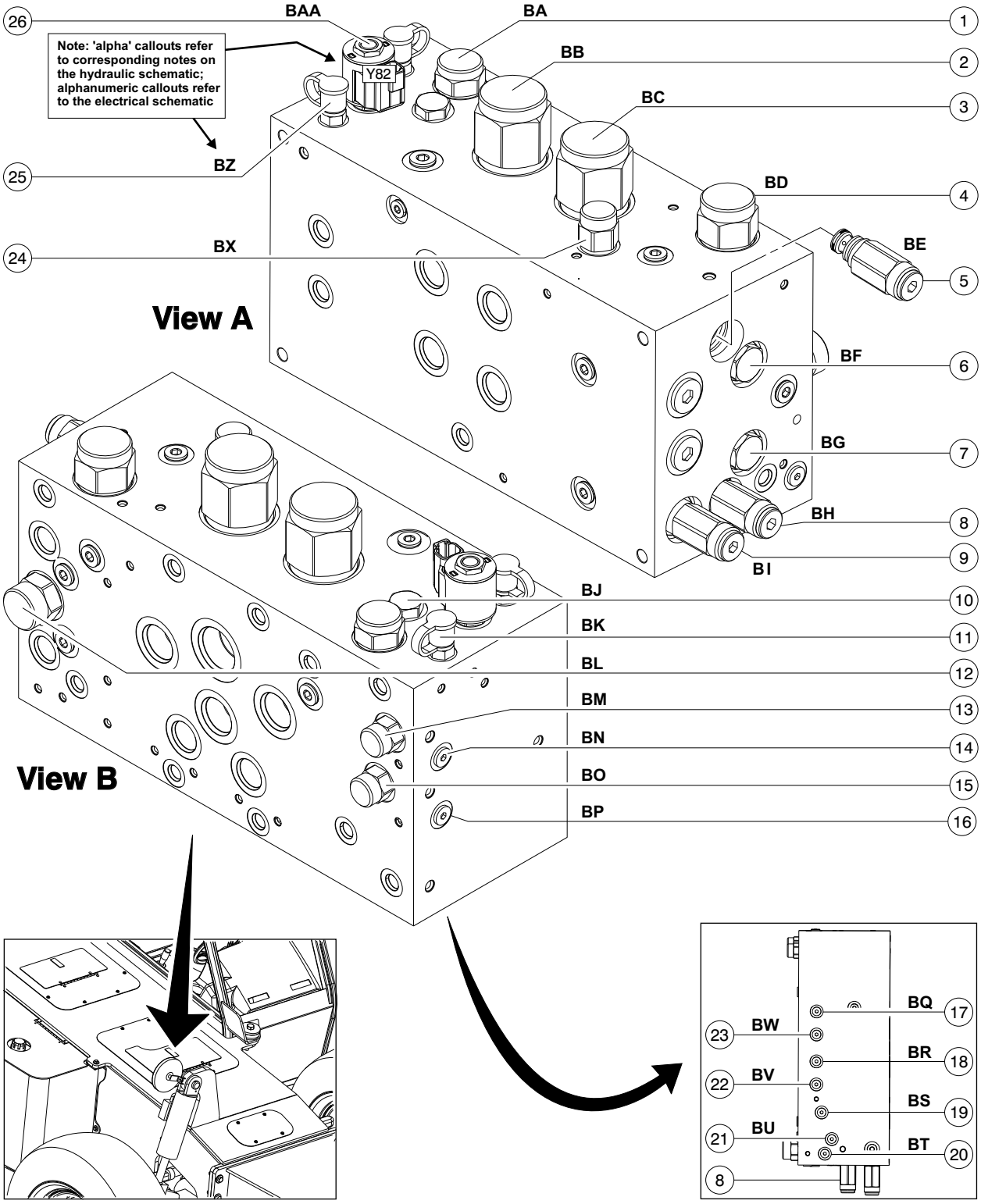
MANIFOLDS

7-2
Primary Function Manifold Components - Models with Dual Joysticks

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Directional valve, 3 position 4 way, pilot operated	BA	Sway left/right	33-37 ft-lbs / 45-50 Nm
2	Directional valve, 3 position 4 way, pilot operated	BB	Boom extend/retract	65-75 ft-lbs / 88-101 Nm
3	Directional valve, 3 position 4 way, pilot operated	BC	Boom up/down	65-75 ft-lbs / 88-101 Nm
4	Directional valve, 3 position 4 way, pilot operated	BD	Fork tilt up/down	46-54 ft-lbs / 61-72 Nm
5	Relief valve, 3500 psi / 241 bar	BE	Fork tilt up relief	20 ft-lbs / 27 Nm
6	Check valve, pilot operated 100 psi / 6.9 bar	BF	Fork tilt down circuit	25 ft-lbs / 34 Nm
7	Check valve, pilot operated 100 psi / 6.9 bar	BG	Fork tilt up circuit	25 ft-lbs / 34 Nm
8	Relief valve, 3500 psi / 241 bar	BH	Fork tilt down relief	20 ft-lbs / 27 Nm
9	Relief valve, 3500 psi / 241 bar	BI	System relief	25 ft-lbs / 34 Nm
10	Shuttle valve	BJ	Function select - sway left/right	20 ft-lbs / 27 Nm
11	Diagnostic nipple	BK	Test port 'LS'	
12	Flow regulator valve, 14 gpm / 53 L/min	BL	Fork tilt up/down circuit	20 ft-lbs / 27 Nm
13	Flow regulator valve, 0.1 gpm / 0.4 L/min	BM	Pilot pressure drain circuit	20 ft-lbs / 27 Nm
14	Check valve, 5 psi / 0.3 bar	BN	Sway left circuit	12-14 ft-lbs / 16-19 Nm
15	Priority flow regulator valve, 2 gpm / 7.6 L/min	BO	Sway left/right circuit	20 ft-lbs / 27 Nm

MANIFOLDS


Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic
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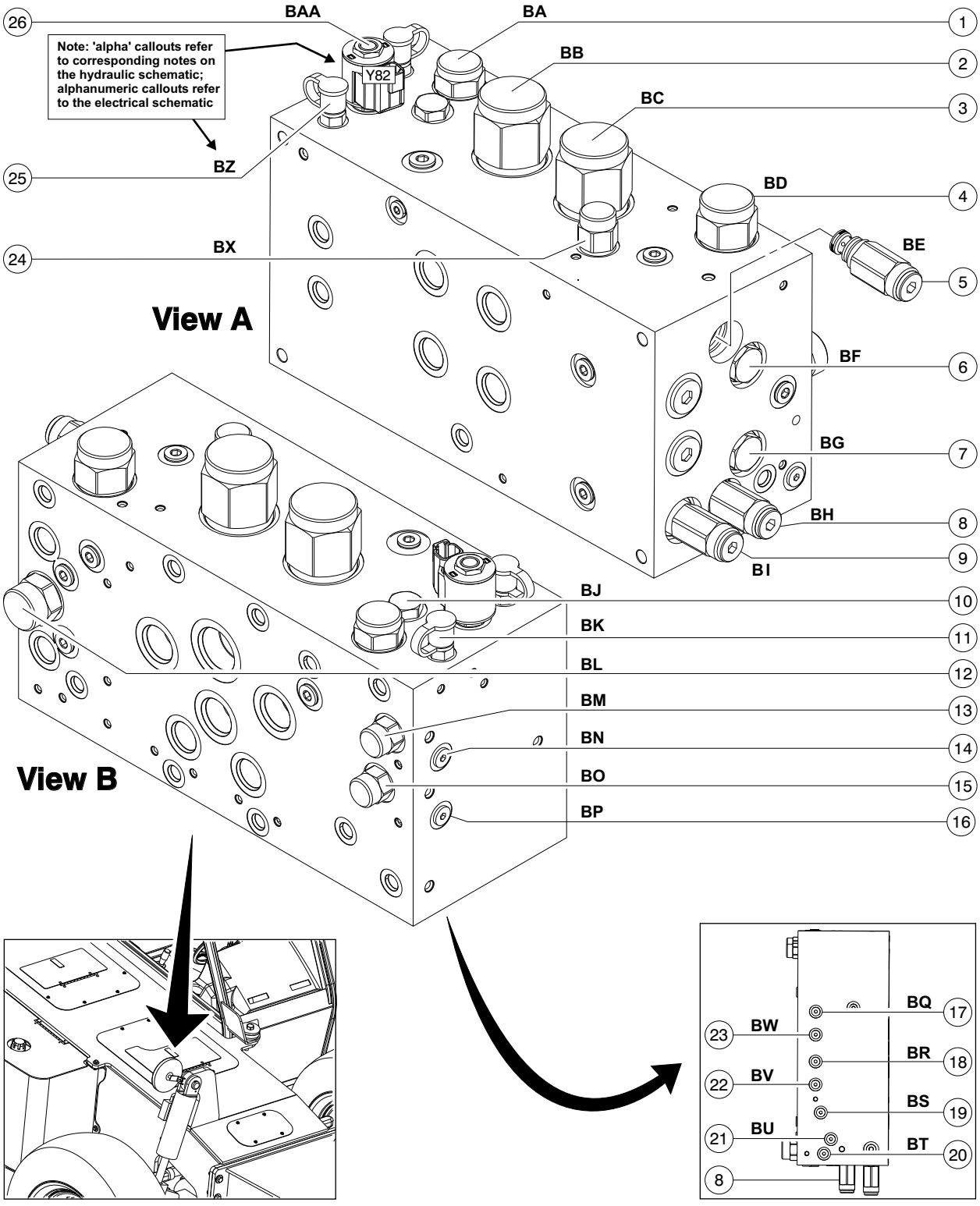
MANIFOLDS

Primary Function Manifold Components - Models with Dual Joysticks, continued

16	Check valve, 5 psi / 0.3 bar	BP	Sway right circuit	12-14 ft-lbs / 16-19 Nm
17	Check valve, 5 psi / 0.3 bar	BQ	Boom extend circuit	12-14 ft-lbs / 16-19 Nm
18	Check valve, 5 psi / 0.3 bar	BR	Boom down circuit	12-14 ft-lbs / 16-19 Nm
19	Check valve, 5 psi / 0.3 bar	BS	Fork tilt down circuit	12-14 ft-lbs / 16-19 Nm
20	Check valve, 5 psi / 0.3 bar	BT	Steer left/right circuit	12-14 ft-lbs / 16-19 Nm
21	Check valve, 5 psi / 0.3 bar	BU	Fork tilt up circuit	12-14 ft-lbs / 16-19 Nm
22	Check valve, 5 psi / 0.3 bar	BV	Boom up circuit	12-14 ft-lbs / 16-19 Nm
23	Check valve, 5 psi / 0.3 bar	BW	Boom retract circuit	12-14 ft-lbs / 16-19 Nm
24	Directional valve, 2 position 2 way, pilot operated	BX	Fork tilt circuit	25 ft-lbs / 34 Nm
25	Diagnostic nipple	BZ	Test port 'TP'	
26	Solenoid valve, 2 position 2 way	BAA	Function select - sway left/right	20 ft-lbs / 27 Nm

MANIFOLDS


Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic
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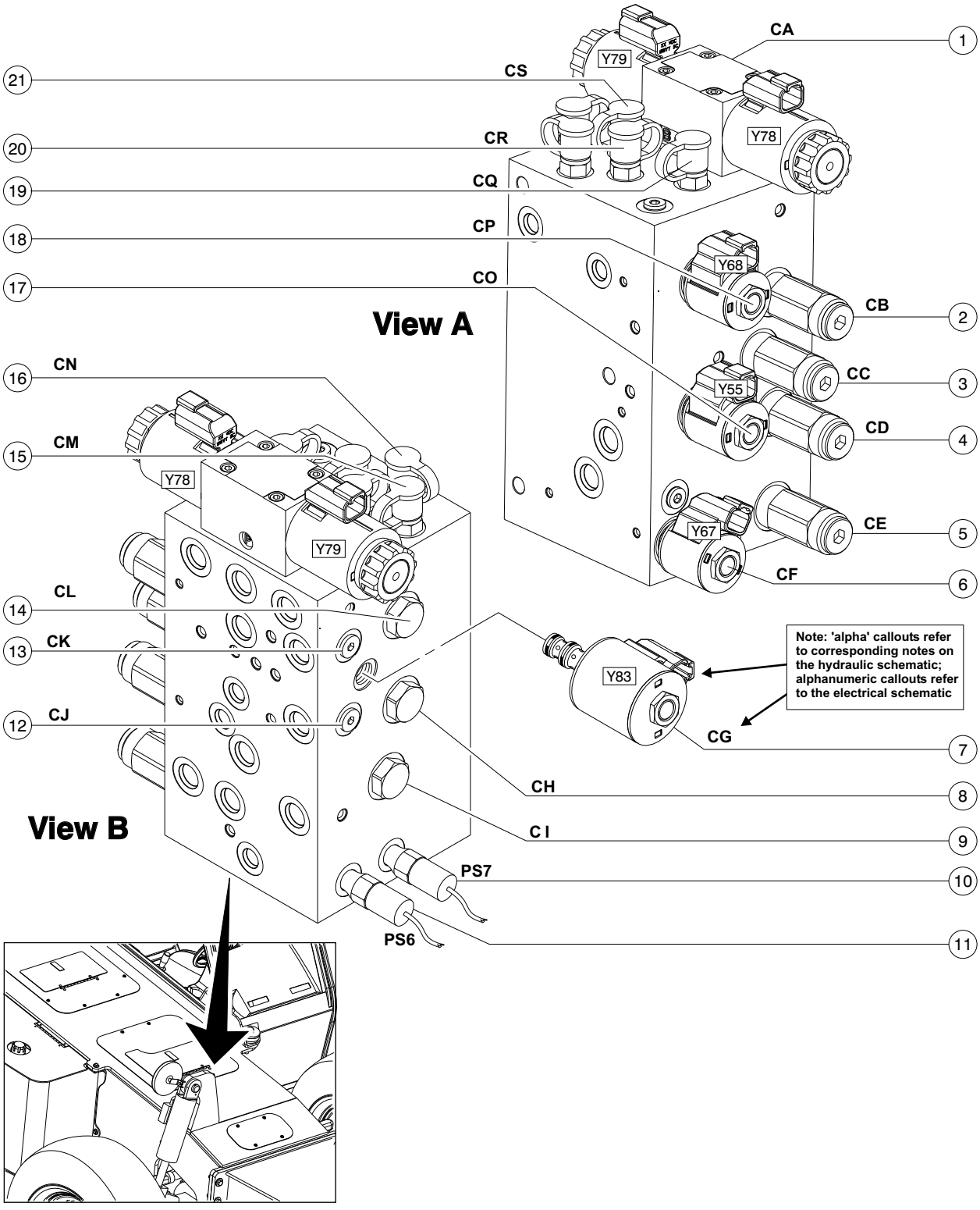
MANIFOLDS

7-3
Secondary Function Manifold Components

The secondary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	DO3 valve, 3 position 4 way	CA	Steer left/right	60 in-lbs / 6.8 Nm
2	Pressure reducing/relief valve, 50 psi / 3.4 bar	CB	Rear lock-up circuit	25-27 ft-lbs / 34-37 Nm
3	Pressure reducing/relief valve, 400 psi / 27.5 bar	CC	Differential lock-up circuit	25-27 ft-lbs / 34-37 Nm
4	Pressure reducing/relief valve, 2500 psi / 172 bar	CD	Steer circuit	25-27 ft-lbs / 34-37 Nm
5	Pressure reducing/relief valve, 400 psi / 27.5 bar	CE	Drive brake circuit	25-27 ft-lbs / 34-37 Nm
6	Solenoid valve, 2 position 3 way	CF	Parking brake select	20 ft-lbs / 27 Nm
7	Solenoid valve, 2 position 4 way	CG	Rear axle fast oscillate select	25 ft-lbs / 34 Nm
8	Check valve, 4 psi / 0.3 bar	CH	Rear lock-up extend circuit	20 ft-lbs / 27 Nm
9	Check valve, 25 psi / 1.7 bar	CI	Drive brake circuit	20 ft-lbs / 27 Nm
10	Pressure switch, 350 psi / 24 bar	PS7	Low brake pressure	11 ft-lbs / 14.9 Nm
11	Pressure switch, 250 psi / 17.2 bar	PS6	Parking brake pressure	11 ft-lbs / 14.9 Nm
12	Orifice, 0.059 in / 1.5 mm	CJ	Rear lock-up extend circuit	
13	Orifice, 0.051 in / 1.3 mm	CK	Rear lock-up retract circuit	
14	Check valve, 4 psi / 0.3 bar	CL	Rear lock-up retract circuit	20 ft-lbs / 27 Nm
15	Diagnostic nipple	CM	Test port 'TB'	
16	Diagnostic nipple	CN	Test port 'TPB'	
17	Solenoid valve, 2 position 3 way	CO	Rear axle oscillate enable select	20 ft-lbs / 27 Nm
18	Solenoid valve, 2 position 3 way	CP	Differential lock-up select	20 ft-lbs / 27 Nm
19	Diagnostic nipple	CQ	Test port 'TJ'	
20	Diagnostic nipple	CR	Test port 'TS'	
21	Diagnostic nipple	CS	Test port 'TR'	

MANIFOLDS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Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic
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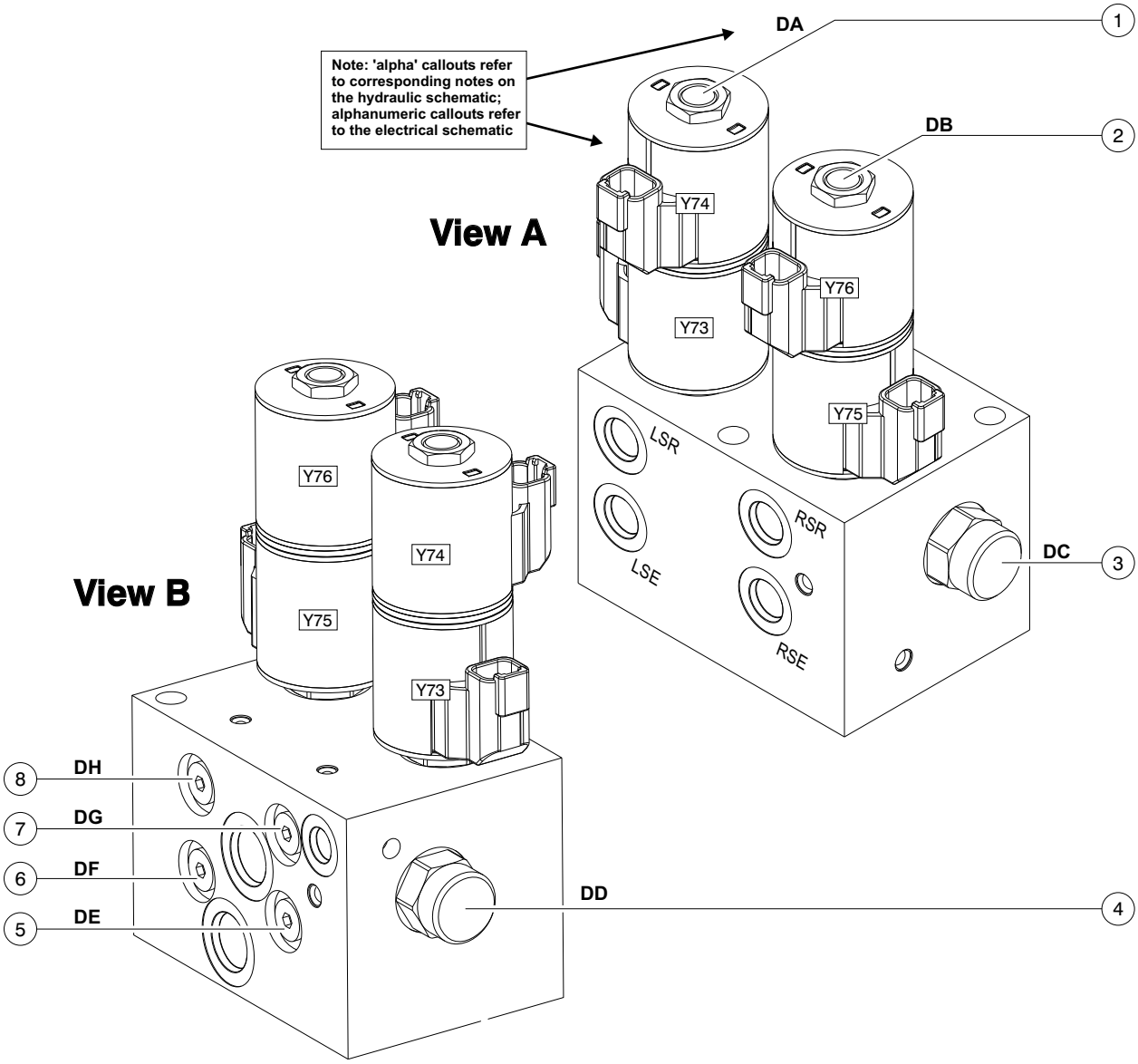
MANIFOLDS

7-4
Outrigger Manifold Components

The outrigger manifold is located under the outrigger inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	DA	Left outrigger extend/retract	25 ft-lbs / 34 Nm
2	Solenoid valve, 3 position 4 way	DB	Right outrigger extend/retract	25 ft-lbs / 34 Nm
3	Flow regulator valve, 6 gpm / 22.7 L/min	DC	Right outrigger circuit	25 ft-lbs / 34 Nm
4	Flow regulator valve, 6 gpm / 22.7 L/min	DD	Left outrigger circuit	25 ft-lbs / 34 Nm
5	Check valve, 5 psi / 0.3 bar	DE	Left outrigger extend circuit	12-14 ft-lbs / 16-19 Nm
6	Check valve, 5 psi / 0.3 bar	DF	Right outrigger extend circuit	12-14 ft-lbs / 16-19 Nm
7	Check valve, 5 psi / 0.3 bar	DG	Left outrigger retract circuit	12-14 ft-lbs / 16-19 Nm
8	Check valve, 5 psi / 0.3 bar	DH	Right outrigger retract circuit	12-14 ft-lbs / 16-19 Nm

MANIFOLDS


Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic; alphanumeric callouts refer to the electrical schematic
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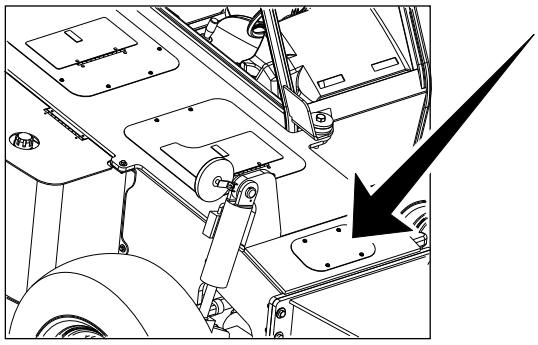
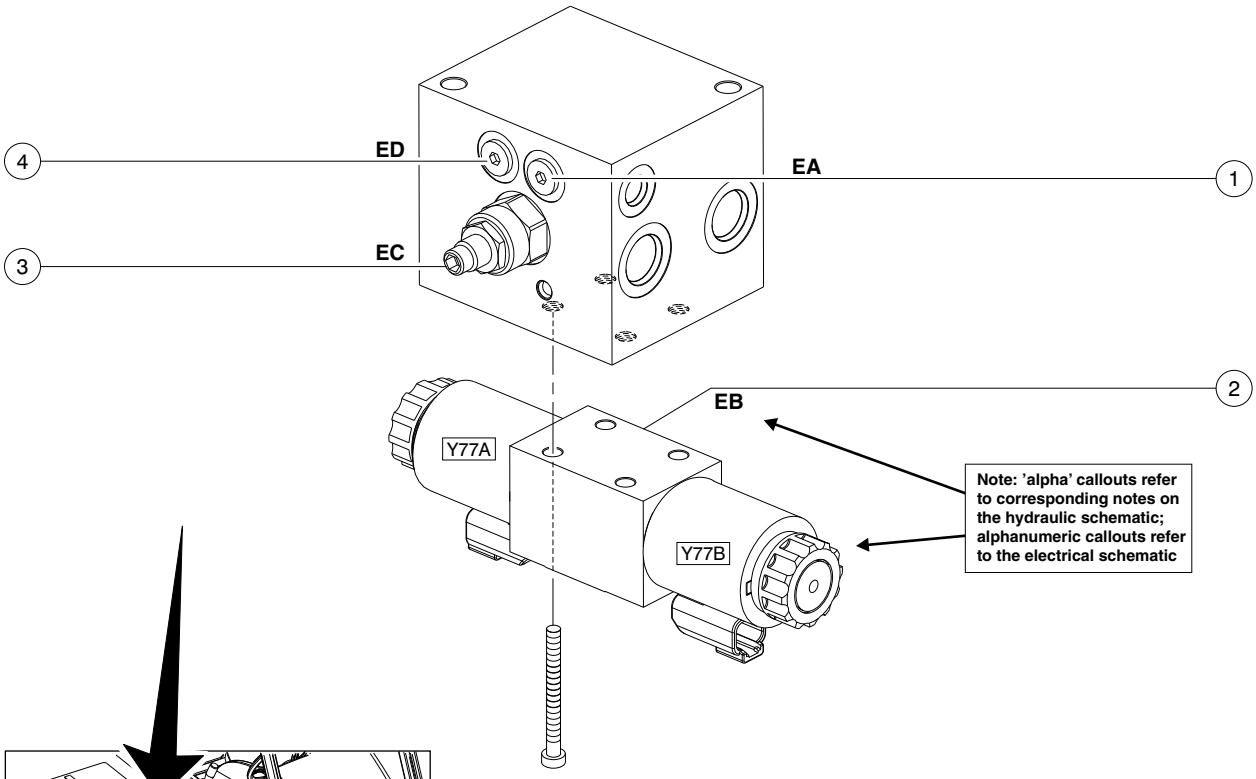


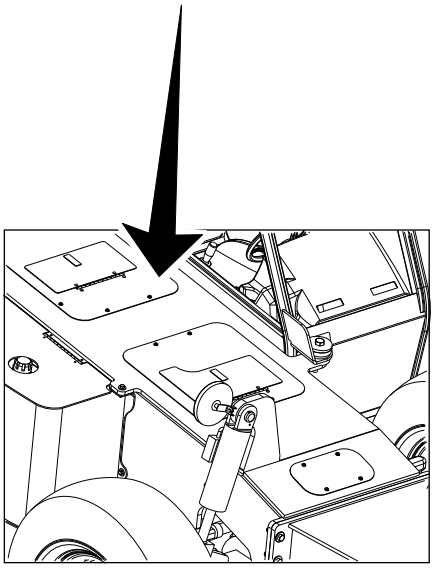
MANIFOLDS

7-5
Auxiliary Manifold Components (option)

The auxiliary manifold is located under the transmission inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.3 bar	EA	Auxiliary 'A1' circuit	12-14 ft-lbs / 16-19 Nm
2	DO3 valve, 3 position 4 way	EB	Auxiliary function enable	60 in-lbs / 6.8 Nm
3	Flow regulator valve	EC	Function speed control	25 ft-lbs / 34 Nm
4	Check valve, 5 psi / 0.3 bar	ED	Auxiliary 'A2' circuit	12-14 ft-lbs / 16-19 Nm

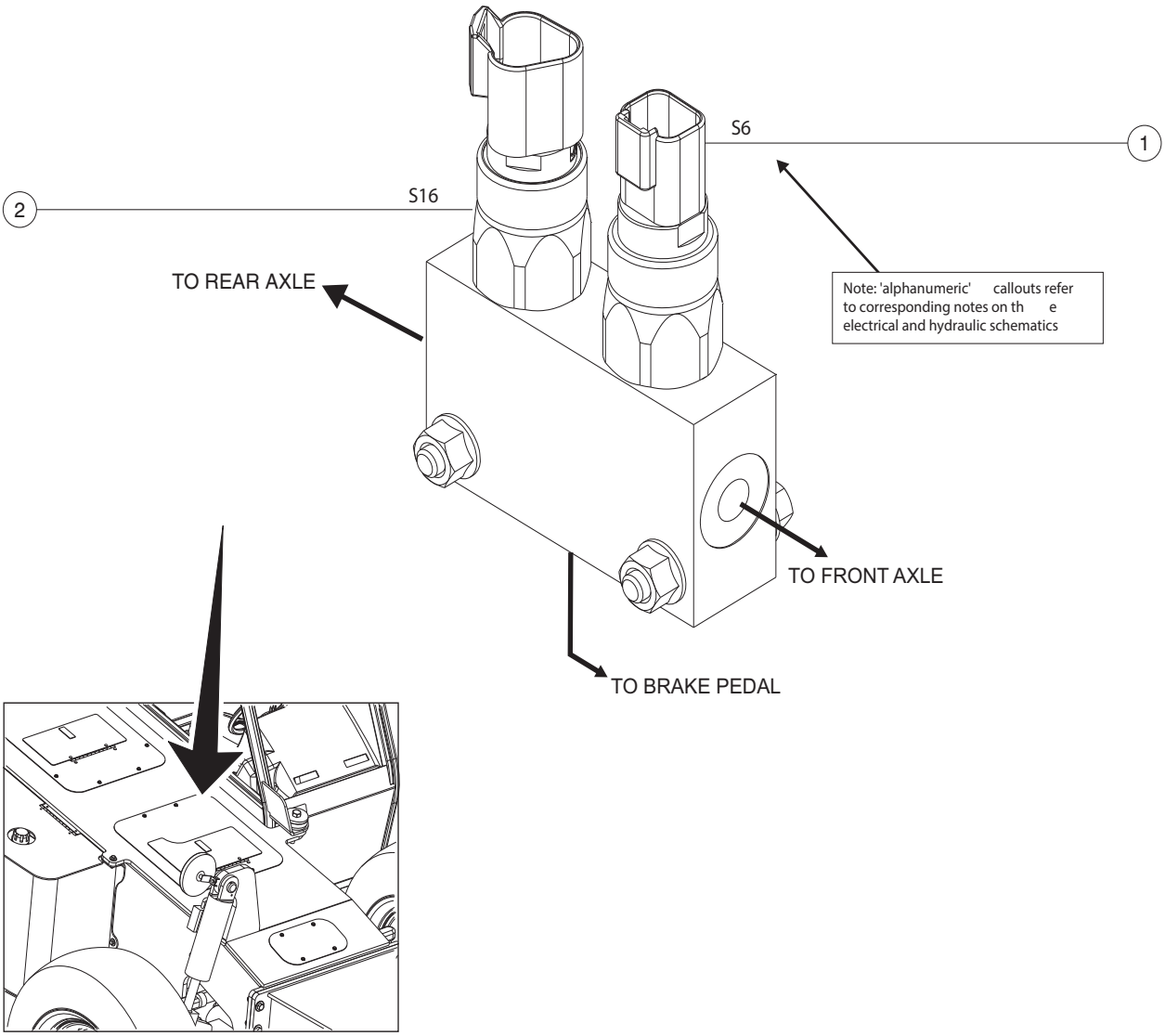




7-6
Brake Manifold Components

The brake manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Pressure switch, 450 psi / 31 bar	PS4	Clutch cut-off pressure	11 ft-lbs / 14.9 Nm
2	Pressure switch, 50 psi / 3.4 bar	PS5	Brake light pressure (option)	11 ft-lbs / 14.9 Nm

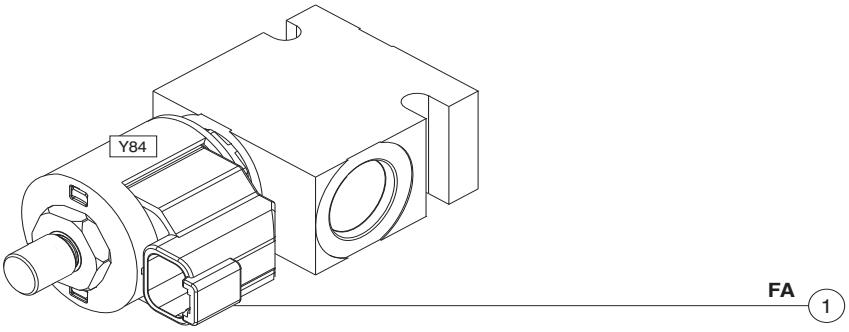


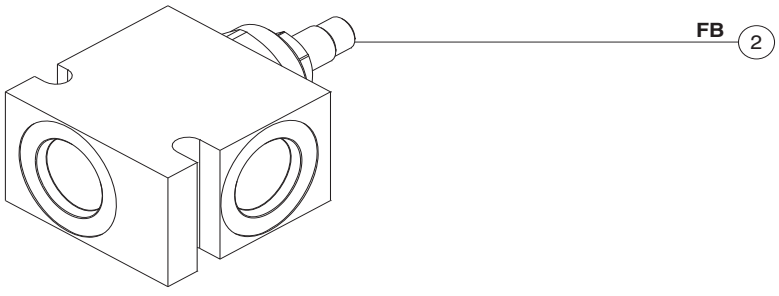
MANIFOLDS

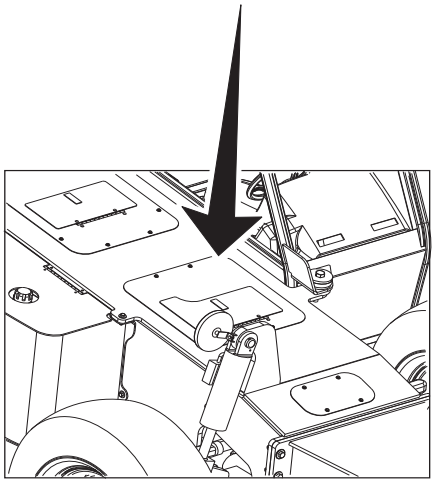
7-7
AC Hydraulic Manifold Components

The AC Hydraulic manifolds are located under the manifold inspection cover.

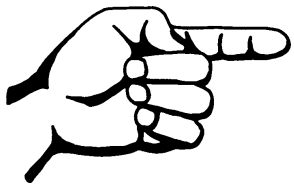
Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	FA	Controls motor	20 ft-lbs / 27.1 Nm
2	Flow control valve, 3 gpm/ 11.3 lpm	FB	Regulates flow	33-37 ft-lbs / 45-50 Nm







Note: 'alphanumeric' callouts refer to corresponding notes on the electrical and hydraulic schematics



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MANIFOLDS

7-8
Valve Adjustments - Secondary Function Manifold

How to Set the Steer System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. See Repair Procedure 6-1, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Install a 0 to 3500 psi / 0 to 250 bar pressure gauge into test port 'TS' at the top of the secondary function manifold (schematic item CR). See 7-3, *Secondary Function Manifold Components*.

6 Start the engine. Allow the engine to idle.

7 Fully turn and hold the steering wheel in the left direction and allow the wheels to fully turn to the left. Continue holding the steering while observing the pressure reading on the pressure gauge.

⊙ Result: The pressure gauge reads 2500 psi / 172 bar. The pressure setting is correct. Proceed to step 12.

⊠ Result: The pressure gauge fails to read 2500 psi / 172 bar. The pressure setting needs to be adjusted. Proceed to step 8.

8 Turn the machine off. Hold the steer pressure reducing/relief valve with a wrench and remove the cap (schematic item CD).

9 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

CAUTION Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

10 Install the relief valve cap.

11 Repeat this procedure beginning with step 6.

12 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

How to Set the Parking Brake System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. See Repair Procedure 6-1, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TPB' at the top of the secondary function manifold (schematic item CN). See 7-3, *Secondary Function Manifold Components*.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 400 psi / 27.5 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 400 psi / 27.5 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the parking brake pressure reducing/relief valve with a wrench and remove the cap (schematic item CE).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

CAUTION Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

MANIFOLDS

How to Set the Differential Lock/Joystick System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. See Repair Procedure 6-1, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TJ' at the top of the secondary function manifold (schematic item CQ). See 7-3, *Secondary Function Manifold Components*.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 400 psi / 27.5 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 400 psi / 27.5 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the steer pressure reducing/relief valve with a wrench and remove the cap (schematic item CC).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

How to Set the Rear Lock-up System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold (schematic item AAA or BZ). See 7-1 or 7-2, *Primary Function Manifold Components*.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. See Repair Procedure 6-1, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Install a 0 to 500 psi / 0 to 50 bar pressure gauge into test port 'TR' at the top of the secondary function manifold (schematic item CS). See 7-3, *Secondary Function Manifold Components*.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 50 psi / 3.4 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 50 psi / 3.4 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the steer pressure reducing/relief valve with a wrench and remove the cap (schematic item CB).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

MANIFOLDS

7-9 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromagnetic force which operates the solenoid valve. Critical to normal operation is continuity within the coil. Zero resistance or infinite resistance indicates the coil has failed.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance using a multimeter set to resistance (Ω). Refer to the Valve Coil Resistance Specification table.

Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

Valve Coil Resistance Specification

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

Description	Specification
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items AA, AD, AY, AAB and BAA)	8.9Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items AAC and EA)	8.9Ω
DO3 valve, 3 position 4 way 12V DC with diode (schematic items CA and EB)	5.6Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items FA)	8.8Ω
Solenoid valve, 2 position 3 way 12V DC with diode (schematic items CF, CO and CP)	8.9Ω
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items CG)	7.3Ω
Solenoid valve, 3 position 4 way 12V DC with diode (schematic items DA and DB)	7.3Ω

How to Test a Coil Diode

Genie incorporates spike suppressing diodes in all of its coils. Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Test the coil for resistance. See 7-8, *How to Test a Coil.*

2 Connect a 10Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Note: The battery should read 9V DC or more when measured across the terminals.

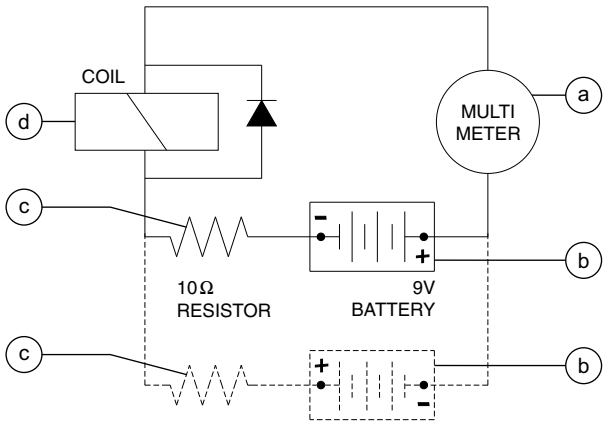
Resistor, 10Ω	
Genie part number	27287

3 Set a multimeter to read DC amperage.

Note: The multimeter, when set to read DC amperage, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

Note: If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.



a multimeter
b 9V DC battery
c 10Ω resistor
d coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Axle

8-1
Axles

How to Remove the Axle

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

1 Chock the wheels.

2 Remove the fasteners securing the driveshaft to the transmission. Lower the end of the driveshaft to the ground.

3 Remove the fasteners securing the driveshaft to the axle. remove the driveshaft from the machine.

4 Loosen the lug nuts of both wheels on the axle to be removed. Do not remove the lug nuts.

5 Raise the end of the machine until the tires are off the ground. Place blocks under the chassis for support.

⚠DANGER Crushing hazard. The chassis will fall if not properly supported.

6 Remove the lug nuts. Remove the tire and wheel assembly from both ends of the axle.

7 Support and secure the axle to an appropriate lifting device.

8 Remove the fasteners securing the sway cylinder rod-end pivot pin to the chassis.

9 Use a soft metal drift to remove the pivot pin.

10 Remove the fasteners securing the axle to the chassis. Remove the axle from the machine.

⚠DANGER Crushing hazard. The axle will fall if not properly supported when the fasteners are removed from the machine.

Bolt torque specification	
Axle mounting bolts	380 ft-lbs 515 Nm

How to Repair the Axle

Repair procedures and additional axle information is available in the *Dana 213 Axle Maintenance and Repair Manual* (Dana part number 0243).

Dana 212 Axle Maintenance and Repair Manual	
Genie part number	115026

Outriggers

9-1 Outriggers

How to Remove an Outrigger

1 Extend the outrigger until the pad just touches the ground. Do not rest the weight of the machine on the outrigger.

2 Tag, disconnect and plug the hydraulic supply hoses at the outrigger cylinder. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the outrigger cylinder barrel-end pivot pin to the machine.

5 Use a soft metal drift to remove the outrigger cylinder barrel-end pivot pin. Lower the cylinder onto the outrigger.

⚠WARNING Crushing hazard. The cylinder may become unbalanced and fall if not properly supported when the pivot pin is removed from the machine.

6 Attach a lifting strap from an overhead crane to the outrigger assembly. Support the outrigger. Do not apply any lifting pressure.

7 Remove the fasteners securing the outrigger pivot pin to the machine.

8 Use a soft metal drift to remove the pivot pin. Remove the outrigger assembly from the machine.

⚠WARNING Crushing hazard. The outrigger will fall if not properly supported when the pivot pin is removed from the machine.

OUTRIGGERS

How to Remove an Outrigger Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Extend the outrigger until the pad just touches the ground. Do not rest the weight of the machine on the outrigger.

2 Tag, disconnect and plug the two hydraulic supply hoses at the outrigger cylinder. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the barrel end of the outrigger cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the outrigger cylinder barrel-end pivot pin to the chassis.

5 Use a soft metal drift to remove the pivot pin.

⚠WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed from the machine.

6 Raise the cylinder to a vertical position.

7 Remove the fasteners securing the outrigger cylinder rod-end pivot pin to the machine.

8 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed from the machine.

Fault Codes

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Key switch in the off position with the key removed
  - Wheels chocked

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

⚠DANGER Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Diagnostic Display

When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory.

Models before Serial Number GTH1012-16292
The fault code is displayed on the engine diagnostic display which is located on the dashboard in the operator's compartment. This backlit LCD display allows the operator to view these fault codes, a description of the code and corrective action needed. When not being used to display fault codes, the display shows the many readouts of engine functions in both English and metric units.

Located at the upper corners of the diagnostic display are amber and red indicator lights. Depending on the severity of a detected engine fault, one of these lights will illuminate indicating an active engine fault:

• Amber - **WARNING**
An amber colored light signals an abnormal engine condition which should be corrected as soon as possible.

• Red - **STOP ENGINE**
A red colored light indicates an engine condition exists which requires the operator to shut down the engine as soon as possible. The ECM will, in some cases, automatically shut down the engine when the red light is displayed.

Access the Active Fault Codes

NOTICE Component damage hazard. Ignoring active fault codes may result in engine damage.

1 During normal operation, engine parameters are visible in the diagnostic display. When an engine fault is detected, the engine parameters on display are immediately replaced with a WARNING message. Also on display are the SPN and FMI codes which are combined to show an engine fault code.

2 If the word "Next" appears at the bottom of the display, this indicates that additional active fault codes exist. Use the arrow keys to scroll to the next code.

3 Press the "Enter" key to acknowledge the active code and return to the engine parameter display.

Access the Stored Fault Codes:

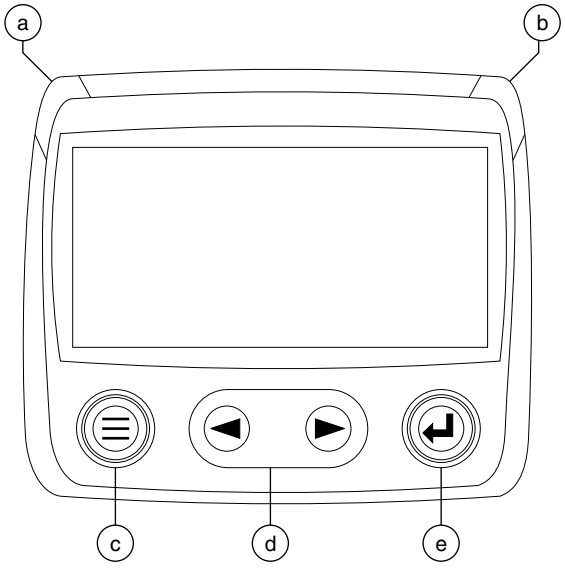
1 Turn the key switch to the on position. Do not start the engine.

2 Press the "Menu" key. Use the "Arrow" keys to scroll to "Stored Codes."

3 Press the "Enter" key to view the stored code.

4 If the word "Next" appears at the bottom of the screen, there are additional codes being stored. Use the "Arrow" key to scroll to the next stored code.

5 Press the "Menu" key to return to the main menu.



Diagnostic display (before Serial Number GTH1012-16292)

a amber warning light
b red stop engine light
c menu key
d arrow/scroll keys
e enter key

DIAGNOSTIC DISPLAY

Models from Serial Number GTH1012-16292
The fault code is displayed on the LCD display which is located on the gauge cluster in the operator's compartment.

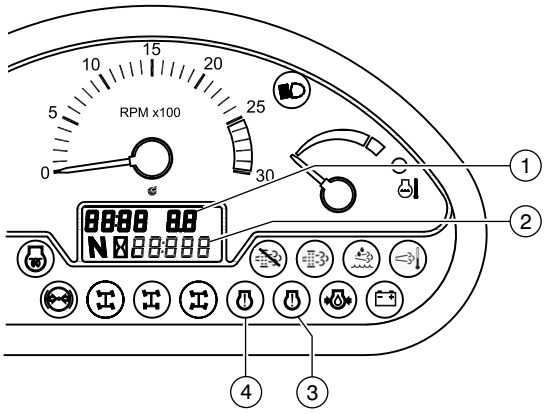
The gauge cluster also includes two warning lights.

They are an amber colored light which signals an abnormal engine condition which should be corrected as soon as possible and a red colored light which signals an engine condition which requres the operator to shut down the engine as soon as possible.

The ECM will, in some cases, automatically shut down the engine when the red light is displayed.

Active Fault Codes

Active Fault Codes will be displayed on the gauge cluster whenever a fault is detected. If multiple fault codes are detected, the fault codes will scroll on the display.



Gauge Cluster
(from Serial Number GTH1012-16292)

1 FMI Code
2 SPN Code or ASPN Code
3 amber warning light
4 red stop engine light

All Models

Active Codes vs Stored Codes

Active fault codes, indicating an engine condition or conditions which have not been corrected, are displayed at the moment the fault is detected.

Stored fault codes are the cumulative history of fault codes which the ECM has detected. These fault codes may be recalled by service personnel at a later time even if the condition which caused the engine fault has ceased to exist.

Note: Additional hardware will be necessary to access stored codes on machines from serial number GTH1012-16292.

Decoding Fault Codes

The Suspect Parameter Number (SPN) or the Alternate Suspect Parameter Number (ASPN) and the Failure Mode Identifier (FMI), when combined, are the basis for an engine fault code. The SPN or ASPN number indicates the affected component; the FMI number reveals the type of failure that has occurred. Comparing the combination of numbers to the fault code chart on the following pages will help to determine the exact engine fault and a corrective course of action. For additional information, refer to the engine operator's manual which came with your machine.

Engine Fault Codes - Models with John Deere Power

SPN	FMI	Description of Fault	Corrective Action
000028	03	Throttle #3 Voltage Out of Range High	Check Sensor and Wiring
	04	Throttle #3 Voltage Out of Range Low	Check Sensor and Wiring
	14	Throttle #3 Voltage Out of Range	Contact Servicing Dealer
000029	03	Throttle #2 Voltage Out of Range High	Check Sensor and Wiring
	04	Throttle #2 Voltage Out of Range Low	Check Sensor and Wiring
	14	Throttle #2 Voltage Out of Range	Contact Servicing Dealer
000091	03	Throttle Voltage Out of Range High	Check Switch and Wiring
	04	Throttle Voltage Out of Range Low	Check Switch and Wiring
	14	Throttle Voltage Out of Range	Check Sensor and Wiring
00094	03	Fuel Pressure Voltage Out of Range High	Check Sensor and Wiring
	04	Fuel Pressure Voltage Out of Range Low	Check Sensor and Wiring
000097	03	Water in Fuel Voltage Out of Range High	Check Sensor and Wiring
	04	Water in Fuel Voltage Out of Range Low	Check Sensor and Wiring
	16	Water in Fuel Detected	Stop and Drain Water Separator
000100	01	Engine Oil Pressure Low-Most Severe	Check Oil Level
	03	Engine Oil Pressure Voltage Out of Range High	Check Sensor and Wiring
	04	Engine Oil Pressure Voltage Out of Range Low	Check Sensor and Wiring
	18	Engine Oil Pressure Low-Moderately Severe	Check Oil Level
	31	Oil Pressure Detected with Zero Engine Speed	Contact Servicing Dealer
000102	02	Manifold Air Pressure Sensor In-Range Failure	Contact Servicing Dealer
	03	Manifold Air Pressure Voltage Out of Range High	Contact Servicing Dealer
	04	Manifold Air Pressure Voltage Out of Range Low	Contact Servicing Dealer
000103	00	Turbocharger Speed High -Most Severe	Contact Servicing Dealer
	02	Turbocharger Speed Data Incorrect	Contact Servicing Dealer
	05	Turbocharger Harness Open Circuit	Contact Servicing Dealer
	06	Turbocharger Harness Shorted To Ground	Contact Servicing Dealer
	08	Turbocharger Speed Signal In-Range Failure	Contact Servicing Dealer
	31	Turbocharger Speed Signal Missing	Contact Servicing Dealer
000105	00	Exhaust Gas Recirculation Air Temperature High - Most Severe	Check Air Cleaner, Aftercooler, or Room Temperature
	03	Exhaust Gas Recirculation Air Temperature Input Voltage Out of Range High	Check Sensor and Wiring
	04	Exhaust Gas Recirculation Air Temperature Input Voltage Out of Range Low	Check Sensor and Wiring
	15	Exhaust Gas Recirculation Air Temperature High - LeastSevere	Check Air Cleaner, Aftercooler, or Room Temperature
	16	Exhaust Gas Recirculation Air Temperature High-Moderately Severe	Check Air Cleaner, Aftercooler, or Room Temperature
000108	02	Barometric Air Pressure Sensor Signal Invalid	Contact Servicing Dealer
	31	Barometric Air Pressure Sensor Signal Invalid	Contact Servicing Dealer
000110	00	Engine Coolant Temperature High-Most Severe	Check Cooling System, Reduce Power
	03	Engine Coolant Temperature Input Voltage Out of Range - High	Check Sensor and Wiring
	04	Engine Coolant Temperature Input Voltage Out of Range - Low	Check Sensor and Wiring
	15	Engine Coolant Temperature High-Least Severe	Check Cooling System, Reduce Power
	16	Engine Coolant Temperature High - Moderately Severe	Check Cooling System, Reduce Power
	17	Engine Coolant Temperature Low-Least Severe	Check Cooling System

ENGINE FAULT CODES -
MODELS WITH JOHN DEERE POWER

SPN	FMI	Description of Fault	Corrective Action
000111	01	Coolant Level Low	Check Operator's Manual
000157	03	Fuel Rail Pressure Voltage Out of Range High	Contact Servicing Dealer
	04	Fuel Rail Pressure Voltage Out of Range Low	Contact Servicing Dealer
	10	Fuel Rail Pressure Drops Too Fast	Contact Servicing Dealer
	17	Fuel Rail Pressure Not Developed	Contact Servicing Dealer
000158	17	Keyswitch Circuit Problem	Contact Servicing Dealer
000174	00	Fuel Temperature High-Most Severe	Add Fuel or Switch Fuel Tanks
	03	Fuel Temperature Voltage Out of Range High	Check Sensor and Wiring
	04	Fuel Temperature Voltage Out of Range Low	Check Senor and Wiring
	16	Fuel Temperature High-Moderately Severe	Add Fuel or Switch Fuel Tanks
000189	00	Engine Speed Derate	Check Fault Codes or Contact Servicing Dealer
000190	00	Engine Speed High-Most Severe	Reduce Engine Speed
	16	Engine Speed High-Moderately Severe	Reduce Engine Speed
000412	00	Exhaust Gas Recirculation Temperature Input Voltage High-Most Severe	Contact Servicing Dealer
	03	Exhaust Gas Recirculation Temperature Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Gas Recirculation Temperature Voltage Out of Range Low	Contact Servicing Dealer
	16	Exhaust Gas Recirculation Temperature Moderately Severe	Contact Servicing Dealer
000611	03	Electronic Injector Wiring Shorted to Power Source	Check Wiring
	04	Electronic Injector Wiring Shorted to Ground	Check Wiring
000620	03	5V Sensor Supply Voltage Out of Range High	Check Wiring
	04	5V Sensor Supply Voltage Out of Range Low	Check Wiring
000627	01	Electronic Injector Supply Voltage Low	Check Battery Voltage and Wiring
	16	ECU Power Supply Voltage High	Contact Servicing Dealer
	18	ECU Power Supply Voltage Low	Contact Servicing Dealer
000628	12	ECU Programming Error	Contact Servicing Dealer
000629	12	ECU Programming Error	Contact Servicing Dealer
	13	ECU Error	Contact Service Dealer
000636	02	Engine Position Sensor Noise	Check Sensor and Wiring
	05	Engine Position Sensor Current Low or Open Circuit	Contact Servicing Dealer
	06	Engine Position Sensor Current High or Grounded Circuit	Contact Servicing Dealer
	08	Engine Position Sensor Input Missing	Check Sensor and Wiring
	10	Engine Position Sensor Pattern Error	Check Sensor and Wiring
000637	02	Timing (Crank) Position Sensor Noise	Check Sensor and Wiring
	05	Timing (Crank) Position Sensor Current Low or Open Circuit	Contact Servicing Dealer
	06	Timing (Crank) Position Sensor Current High or Grounded Circuit	Contact Servicing Dealer
	07	Crank/Camshaft Position Out of Sync	Check Sensor and Wiring
	08	Crank Position Input Missing	Check Sensor and Wiring
	10	Crank Position Input Pattern Error	Check Sensor and Wiring
000640	31	External Engine Protection Signal Not Recognized	Engine External Protection Unknown. Check Installation
000641	04	Turbocharger Actuator Disabled	Contact Servicing Dealer
	05	Turbocharger Actuator Current Low or Open Circuit	Contact Servicing Dealer
	12	Turbocharger Actuator Communication Error	Contact Servicing Dealer
	13	Turbocharger Learn Error	Contact Servicing Dealer
	16	Turbocharger Temperature High-Moderately Severe	Contact Servicing Dealer

ENGINE FAULT CODES -
MODELS WITH JOHN DEERE POWER

SPN	FMI	Description of Fault	Corrective Action
000651	02	Cylinder #1 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #1 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #1 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #1 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #1 Injector QR Code String Error	Contact Servicing Dealer
000652	02	Cylinder #2 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #2 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #2 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #2 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #2 Injector QR Code String Error	Contact Servicing Dealer
000653	02	Cylinder #3 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #3 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #3 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #3 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #3 Injector QR Code String Error	Contact Servicing Dealer
000654	02	Cylinder #4 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #4 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #4 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #4 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #4 Injector QR Code String Error	Contact Servicing Dealer
000655	02	Cylinder #5 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #5 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #5 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #5 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #5 Injector QR Code String Error	Contact Servicing Dealer
000656	02	Cylinder #6 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #6 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #6 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #6 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #6 Injector QR Code String Error	Contact Servicing Dealer
000676	03	Glow Plug Relay Voltage High	Check Relay and Wiring
	04	Glow Plug Relay Voltage Low	Check Relay and Wiring
000898	09	Vehicle Speed or Torque Message Invalid	Contact Servicing Dealer
000970	31	Auxiliary Engine Shutdown Signal	Non Engine Fault. Check Other Shutdown Devices
000971	31	Auxiliary Engine Derate Signal	Non Engine Fault. Check Other Shutdown Devices
001079	03	Sensor Supply Voltage 3 Out of Range High	Check Wiring
	04	Sensor Supply Voltage 3 Out of Range Low	Check Wiring
001080	03	Fuel Rail Pressure Sensor Supply Voltage 2 Out of Range High	Check Wiring
	04	Fuel Rail Pressure Sensor Supply Voltage 2 Out of Range Low	Check Wiring
001109	31	Engine Protection System Approaching Shutdown	Check Fault Codes
001110	31	Engine Protection System Shutdown Engine	Check Fault Codes
001136	00	ECU Temperature High - Most Severe	Contact Servicing Dealer
	16	ECU Temperature High - Moderately Severe	Contact Servicing Dealer
001172	03	Turbo Compressor Inlet Temperature Input Voltage Out of Range High	Contact Servicing Dealer
	04	Turbo Compressor Inlet Temperature Input Voltage Out of Range Low	Contact Servicing Dealer
	16	Turbo Compressor Inlet Temperature High - Moderately Severe	Contact Servicing Dealer

ENGINE FAULT CODES -
MODELS WITH JOHN DEERE POWER

SPN	FMI	Description of Fault	Corrective Action
001180	00	Turbo Turbine Inlet Temperature High-Most Severe	Contact Servicing Dealer
	16	Turbo Turbine Inlet Temperature High - Moderately Severe	Contact Servicing Dealer
001209	02	Exhaust Pressure Incorrect	Contact Servicing Dealer
	03	Exhaust Pressure Sensor Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Pressure Sensor Voltage Out of Range Low	Contact Servicing Dealer
001347	03	Fuel Pump Pressurizing Assembly #1 Sensor Voltage High	Contact Servicing Dealer
	05	Fuel Pump Pressurizing Assembly #1 Sensor Circuit Open, Shorted to Ground, or Overloaded	Check Pump Wiring
	07	Fuel Pump Assembly #1 Rail Pressure Contro Mismatch	Check Fuel Filter and Lines
001569	31	Engine Protection Derate	Check Fault Codes
002630	00	Exhaust Gas Recirculation Fresh Air Temperature High-Most Severe	Contact Servicing Dealer
	03	Exhaust Gas Recirculation Fresh Air Temperature Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Gas Recirculation Fresh Air Temperature Voltage Out of Range Low	Contact Servicing Dealer
	15	Exhaust Gas Recirculation Fresh Air Temperature High-Least Severe	Contact Servicing Dealer
	16	Exhaust Gas Recirculation Fresh Air Temperature High-Moderately Severe	Contact Servicing Dealer
002659	02	Exhaust Gas Recirculation Flow/Temperature Mismatch	Contact Servicing Dealer
	15	Exhaust Gas Recirculation Flow Rate Above Normal	Contact Servicing Dealer
	17	Exhaust Gas Recirculation Flow Rate Below Normal	Contact Servicing Dealer
002790	16	Turbocharger Compressor Outlet Temperature High - Most Severe	Contact Servicing Dealer
002791	02	Exhaust Gas Recirculation Valve Sensor Voltage Mismatch	Contact Servicing Dealer
	03	Exhaust Gas Recirculation Valve Sensor Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Gas Recirculation Valve Sensor Voltage Out of Range Low	Contact Servicing Dealer
	05	Exhaust Gas Recirculation Valve Current Low or Open Circuit	Contact Servicing Dealer
	06	Exhaust Gas Recirculation Valve Current High or Grounded Circuit	Contact Servicing Dealer
	07	Exhaust Gas Recirculation Valve Not Responding or Out of Adjustment	Contact Servicing Dealer
	13	Exhaust Gas Recirculation Valve Out of Calibration	Contact Servicing Dealer
	14	Exhaust Gas Recirculation Valve Off	Contact Servicing Dealer
	31	Exhaust Gas Recirculation Valve Position Error	Contact Servicing Dealer
002795	07	Turbocharger Actuator Not Responding or Out Of Adjustment	Contact Servicing Dealer
	12	Turbocharger Actuator Bad Intelligent Device Or Component	Contact Servicing Dealer
523222	03	Sensor Supply Voltage #5 Out of Range High	Contact Servicing Dealer
	04	Sensor Supply Voltage #5 Out of Range Low	Contact Servicing Dealer
523229	03	Sensor Supply Voltage #4 Out of Range High	Contact Servicing Dealer
	04	Sensor Supply Voltage #4 Out of Range Low	Contact Servicing Dealer

Engine Fault Codes - Models with Deutz Power

SPN = Suspect Parameter Number
ASPN = Alternate Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	ASPN	FMI	Description
29		3	Hand throttle error, short circuit to battery on idle validation switch or sensor error
		4	Hand throttle error, short circuit to ground on idle validation switch or sensor error
51		3	Temperature to high for power stage of EGR-Valve (2.9;3.6) / Throttle-Valve (6.1,7.8) or position sensor error
		4	Open load actuator EGR-Valve (2.9;3.6) / Throttle-Valve (6.1,7.8) or position sensor error
		5	Target range to low for actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8)
		6	Target range to high for actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8)
		7	The actuator position for EGR-Valve (2.9,3.6) or Throttle-Valve (6.1,7.8) is not plausible
		12	Open load actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8)
91		3	Target range to high for accelerator pedal sensor
		4	Target range to low for accelerator pedal sensor
		8	PWM signal accelerator pedal out of target range, to high
		11	Plausibility check between APP1 and APP2 or APP1 and idle switch
94		1	Low fuel pressure is out of target range; system reaction generated
		3	Target range to high for low fuel pressure sensor
		4	Target range to low for low fuel pressure sensor
97		3	Water in Fuel Sensor - Short Circuit to U-Batt
		12	Water level in fuel prefilter above maximum value
100		0	High oil pressure; system reaction generated
		1	Low oil pressure; system reaction generated
		3	Target range to high for oil pressure sensor
		4	Target range to low for oil pressure sensor
108		3	Target range to high for ambient air pressure sensor
		4	Target range to low for ambient air pressure sensor
110		0	Coolant temperature is out of target range; system reaction generated
		3	Target range to high for coolant temperature sensor
		4	Target range to low for coolant temperature sensor

ENGINE FAULT CODES - MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
111		1	Coolant level underneath the allowed minimum
157		3	Target range to high for rail pressure sensor
		4	Target range to low for rail pressure sensor
168		0	Battery voltage is out of the target range (to high)
		1	Battery voltage is out of the target range (to low)
		2	Battery voltage is out of the target range; warning condition is generated
		3	Target range to high for battery voltage sensor
		4	Target range to low for battery voltage sensor
172		2	Ambient air temperature sensor value is not plausible
		3	Target range to high for intake air sensor
		4	Target range to low for intake air sensor
174		0	Low fuel temperature is out of target range; system reaction generated
175		0	Oil temperature is out of target range; system reaction generated
		1	Physical Range Check low for Oil Temperature
		2	Oil temperature value is not plausible
		3	Target range to high for oil temperature sensor
		4	Target range to low for oil temperature sensor
190		0	Engine speed target range exceeded; FOC-range 1
		2	Speed sensor of crankshaft and camshaft signals are out of phase
		8	Speed sensor signal not plausible
		11	Engine speed target range exceeded; FOC-range 2
		12	Speed sensor no signal
		14	Engine speed target range exceeded; overrun mode
412		0	Differential pressure sensor value (AGR) out of target range, to high
		1	Differential pressure sensor value (AGR) out of target range, to low
		3	SRC high for EGR cooler downstream temperature sensor
		4	SRC low for EGR cooler downstream temperature sensor
520		9	Timeout Error of CAN-Receive-Frame TSC1TR
597		2	Break Lever Main switch and Break Lever Redundancy switch status not plausible

ENGINE FAULT CODES -
MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
624		3	Short circuit to battery on SVS lamp
		4	Short circuit to ground on SVS lamp
		5	No load error SVS lamp
		12	Temperature to high for power stage of SVS lamp
630		12	Access error EEPROM memory
639		14	CAN-Bus 0 "BusOff"-Status
651		3	General short circuit injector 1
		5	Interruption of electric connection injector 1
652		3	General short circuit injector 2
		5	Interruption of electric connection injector 2
653		3	General short circuit injector 3
		5	Interruption of electric connection injector 3
654		3	General short circuit injector 4
		5	Interruption of electric connection injector 4
655		3	General short circuit injector 5
		5	Interruption of electric connection injector 5
656		3	General short circuit injector 6
		5	Interruption of electric connection injector 6
677		3	Short circuit on high side starter relay
		4	Short circuit on low side starter relay
		5	No load error starter relay
		12	Over load ECU power stage for Starter (overtemp.)
729		5	Air Heater not connected.
1079		13	Sensor supply voltage monitor error
1109		2	Engine off request ignored

ENGINE FAULT CODES -
MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
1180		3	Target range to high for exhaust gas temperature sensor
		4	Target range to low for exhaust gas temperature sensor
		11	Exhaust gas temperature value before turbine (upstream) not plausible
1231		14	CAN-Bus 1 "BusOff"-Status
1235		14	CAN-Bus 2 "BusOff"-Status
1761		1	Urea tank temperature sensor value is out of the target range (to low); warning condition is generated
3031		0	Urea tank temperature sensor value out of the target range (to high)
		1	Urea tank temperature sensor value is out of the target range (to low); warning condition is generated
3224		1	Plausibility error Min for NOx sensor upstream of SCR Cat
		9	Timeout Error of CAN-Receive-Frame AT1IG1Vol; AT1O1; AT1OG1Vol
3234		9	Timeout Error of CAN-Receive-Frame AT1IG1Vol; AT1O1; AT1OG1Vol
		11	Nox sensor value downstream not plausible "stuck in range"
3241		1	Target range to low for SCR catalyst upstream temperature sensor
3251		0	Differential pressure sensor value (DPF) out of target range, to high
		1	Differential pressure sensor value (DPF) out of target range, to low
3253		2	Differential pressure sensor signal (DPF) not plausible
		3	Target range to high for differential pressure sensor (DPF)
		4	Target range to low for differential pressure sensor (DPF)
3361		3	Short circuit to battery at powerstage of Urea dosing valve
		4	Short circuit to ground at powerstage of Urea dosing valve
		7	Dosing valve blocked
3532		3	Target range to high for urea tank level sensor
		4	Target range to low for urea tank level sensor
4243		11	Urea heating procedure not successful
4334		0	Target range to high for urea pump module pressure sensor before pressure build up
		1	Physical range check low for urea pump module pressure sensor
4343		11	General pressure check error (SCR)
4345		11	General backflow line plausibility error (SCR)

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
4360		0	Urea catalyst upstream temperature out of the target range (to high)
		1	Urea catalyst upstream temperature out of the target range (to low)
4361		3	Target range to high for urea catalyst exhaust gas temperature sensor upstream
		4	Target range to low for urea catalyst exhaust gas temperature sensor upstream
4365		0	Urea tank temperature too high
		3	Short circuit to battery error on urea tank sensor
		4	Short circuit to ground error on urea tank sensor
4366		5	SCR main relay short circuit or open load
4374		13	Pressure stabilization error dosing valve (SCR)
4375		3	Short circuit to battery on powerstage for urea pump motor
		4	Short circuit to ground on powerstage for urea pump motor
		5	No load error on powerstage for urea pump motor
4376		3	Short circuit to battery on SCR reversal valve
		4	Short circuit to ground on SCR reversal valve
		5	No load error SCR reversal valve
4765		0	Exhaust gas temperature sensor value upstream (DOC) out of target range, to high
		1	Exhaust gas temperature sensor value upstream (DOC) out of target range, to low
4766		0	Exhaust gas temperature sensor value downstream (DOC) out of target range, to high
		1	Exhaust gas temperature sensor value downstream (DOC) out of target range, to low
4768		2	Exhaust gas temperature sensor signal upstream (DOC) not plausible
		3	Exhaust gas temperature sensor voltage to high
		4	Exhaust gas temperature sensor voltage to low
4769		2	Exhaust gas temperature sensor signal downstream (DOC) not plausible
		3	Target range to high for exhaust gas temperature sensor downstream (DOC)
		4	Target range to low for exhaust gas temperature sensor downstream (DOC)

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
23006	**64254**	**3**	Controller mode switch; short circuit to battery
		4	Controller mode switch; short circuit to ground
23008	**64256**	**1**	Manipulation control was triggered
		2	Timeout error in Manipulation control
23009	**64257**	**9**	Pressure Relief Valve (PRV) reached maximun allowed opening count
		10	Pressure relief valve (PRV) reached maximun allowed open time
23212	**64460**	**9**	Timeout Error of CAN-Receive-Frame ComEngPrt; Engine Protection
23216	**64464**	**9**	Timeout Error of CAN-Receive-Frame PrHtEnCmd; pre-heat command, engine command
23240	**64488**	**9**	Timeout CAN-message FunModCtl; Function Mode Control
23330	**64578**	**14**	Immobilizer status; fuel blocked
23350	**64598**	**4**	Injector cylinder-bank 1; short circuit
23352	**64600**	**4**	Injector cylinder-bank 2; short circuit
23354	**64602**	**12**	Injector powerstage output defect
23450	**64698**	**2**	Multiple Stage Switch constant speed; plausibility error
		3	Multiple Stage Switch constant speed; short circuit to battery
		4	Multiple Stage Switch constant speed; short circuit to ground
23451	**64699**	**2**	Multiple Stage Switch engine speed control parameter; plausibility error
		3	Multiple Stage Switch engine speed control parameter; short circuit to battery
		4	Multiple Stage Switch engine speed control parameter; short circuit to ground
23452	**64700**	**2**	Multiple Stage Switch engine torque limitation curve; plausibility error
		3	Multiple Stage Switch engine torque limitation curve; short circuit to battery
		4	Multiple Stage Switch engine torque limitation curve; short circuit to ground
23470	**64718**	**2**	Pressure Relief Valve (PRV) forced to open
		7	Maximum rail pressure in limp home mode exceeded (PRV)
		11	Pressure Relief Valve (PRV) error; Rail pressure out of tolerance range Rail pressure out of tolerance range
		12	Pressure Relief Valve (PRV) forced to open; system reaction initiated
		14	Pressure Relief Valve (PRV) is open

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SPN	ASPN	FMI	Description
23550	**64798**	**12**	T50 start switch active for too long
23601	**64849**	**13**	Sensor supply voltage monitor 3 error (ECU)
23602	**64850**	**0**	Fan control; out of range, system reaction initiated
23603	**64851**	**9**	Timeout Error of CAN-Receive-Frame AMB; Ambient Temperature Sensor
23605	**64853**	**9**	Timeout Error of CAN-Receive-Frame TSC1AE; Traction Control
23606	**64854**	**9**	Timeout Error of CAN-Receive-Frame TSC1AR; Retarder
23612	**64860**	**12**	ECU reported internal software error
			Internal software error ECU
		14	Softwarereset CPU
23613	**64861**	**0**	Rail pressure disrupted
		1	Minimum rail pressure exceeded (RailMeUn3)
		2	Setpoint of metering unit in overrun mode not plausible
23615	**64863**	**3**	Metering unit (Fuel-System); short circuit to battery
		4	Metering unit (Fuel-System); short circuit to ground
		5	Metering unit (Fuel-System); open load
		12	Metering unit (Fuel-System); powerstage over temperature
23619	**64867**	**2**	Physical range check high for exhaust gas temperature upstrem (SCR-CAT)
23632	**64880**	**0**	Pressure overload of SCR-System
		1	Pressure build-up error SCR-System
		2	Metering control is not performed in time error
		16	Pump pressure SCR metering unit too high
		18	Pump pressure SCR metering unit too low
23633	**64881**	**11**	Nox conversion rate insufficient
23698	**64946**	**11**	Shut off request from supervisory monitoring function
23717	**64965**	**12**	Timeout Error of CAN-Transmit-Frame AmbCon; Weather environments
23718	**64966**	**3**	SCR main relay (primary side); short circuit to battery
			SCR mainrelay; short circuit to battery (only CV56B)
		4	SCR main relay (primary side); short circuit to ground
			SCR mainrelay; short circuit to ground (only CV56B)
		5	SCR main relay (primary side); open load
			SCR mainrelay; open load (only CV56B)
		12	SCR mainrelay; powerstage over temperature (only CV56B)

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
23719	**64967**	**3**	SCR heater urea supplymodule; short circuit to battery
		4	SCR heater urea supplymodule; short circuit to ground
		5	SCR heater relay urea supply module; open load
23720	**64968**	**2**	Urea supply module heater temperature; plausibility error
		8	Urea supply module heater temperature; signal disrupted
23721	**64969**	**2**	Urea supply module heater temperature; plausibility error
		8	Urea supply module temperature; signal disrupted
		11	Urea supply module temperature measurement not available
23722	**64970**	**8**	Urea supply module PWM signal; signal disrupted
23723	**64971**	**11**	Detection of AdBlue filled SCR system in Init-State
23766	**65014**	**9**	Timeout Error of CAN-Receive-Frame Active TSC1AE
23767	**65015**	**9**	Timeout Error of CAN-Receive-Frame Passive TSC1AE
23768	**65016**	**9**	Timeout Error of CAN-Receive-Frame Active TSC1AR
23769	**65017**	**9**	Timeout Error of CAN-Receive-Frame Passive TSC1AR
23770	**65018**	**9**	Timeout Error of CAN-Receive-Frame Passive TSC1DE
23776	**65024**	**9**	Timeout Error of CAN-Receive-Frame TSC1TE - active
23777	**65025**	**9**	Passive Timeout Error of CAN-Receive-Frame TSC1TE; Setpoint
23778	**65026**	**9**	Active Timeout Errorof CAN-Receive-Frame TSC1TR
23779	**65027**	**9**	Passive Timeout Error of CAN-Receive-Frame TSC1TR
23788	**65036**	**0**	Turbo charger wastegate; CAN Fehler
		12	Timeout Error of CAN-Transmit-Frame TrbCH; Status Wastegate
23793	**65041**	**9**	Timeout Error of CAN-Receive-Frame UAA10; AGS sensor service message
23794	**65042**	**9**	Timeout Error of CAN-Receive-Frame UAA11; AGS sensor data
23803	**65051**	**9**	Timeout Error of CAN-Receive-Frame RxEngPres; Status burner airpump
23867	**65115**	**12**	Timeout Error of CAN-Transmit-Frame UAA1 on CAN 2; Burner Air Pump Control
23895	**65143**	**13**	Check of missing injector adjustment value programming (IMA) injector 1 (in firing order)
23896	**65144**	**13**	check of missing injector adjustment value programming (IMA) injector 2 (in firing order)
23897	**65145**	**13**	check of missing injector adjustment value programming (IMA) injector 3 (in firing order)

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SPN	ASPN	FMI	Description
23898	**65146**	**13**	check of missing injector adjustment value programming (IMA) injector 4 (in firing order)
23899	**65147**	**13**	check of missing injector adjustment value programming (IMA) injector 5 (in firing order)
23900	**65148**	**13**	check of missing injector adjustment value programming (IMA) injector 6 (in firing order)
23910	**65158**	**0**	Air Pump; internal error
		6	Air Pump; over current
		7	Air pump; CAN communication interrupted no purge function available
		9	Air Pump; CAN communication lost
		12	Air Pump; internal error
		14	Air pump doesn´t achieve air mass flow setpoint
23911	**65159**	**0**	Burner dosing valve (DV2); overcurrent at the end of the injection phase
		3	Burner dosing valve (DV2); short circuit to battery
		4	Burner dosing valve (DV2); short circuit to ground
		7	Burner dosing valve (DV2); blocked closed
		11	Burner dosing valve (DV2); short circuit high side powerstage
		12	Burner dosing valve (DV2); powerstage over temperature
23912	**65160**	**0**	Physical range check high for burner dosing valve (DV2) downstream pressure;shut off regeneration
		1	Physical range check low for burner dosing valve (DV2) downstream pressure; shut off regeneration. When burner injector is actuated, the measured pressure does not rise above ca. 1250mbar abs (expected: ca. 2400mbar).
		2	Burner dosing valve (DV2) downstream pressure sensor; plausibility error
		3	Sensor error burner dosing valve (DV2) downstream pressure sensor; signal range check high
		4	Sensor error burner dosing valve (DV2) downstream pressure sensor; signal range check low
23913	**65161**	**3**	Sensor error glow plug control diagnostic line voltage; signal range check high
		4	Sensor error glow plug control diagnostic line voltage; signal range check low

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SPN	ASPN	FMI	Description
23914	**65162**	**3**	Glow plug control; short circuit to battery
		4	Glow plug control; short circuit to ground
		5	Glow plug control; open load
		11	Glow plug control; internal error
		12	Glow plug control; powerstage over temperature
23915	**65163**	**0**	HCI dosing valve (DV1); overcurrent at the end of the injection phase
		3	HCI dosing valve (DV1); short circuit to battery
		4	HCI dosing valve (DV1); short circuit to ground
		7	HCI dosing valve (DV1); blocked
		11	HCI dosing valve (DV1); short circuit high side powerstage
		12	HCI dosing valve (DV1); powerstage over temperature
23916	**65164**	**0**	Physical range check high for HCI dosing valve (DV1) downstream pressure; shut off regeneration
		1	Physical range check low for HCI dosing valve (DV1) downstream pressure; shut off regeneration
		2	Sensor HCI dosing valve (DV1) downstream pressure; plausibility error
		3	Sensor error HCI dosing valve (DV1) downstream pressure; signal range check high
		4	Sensor error HCI dosing valve (DV1) downstream pressure; signal range check low
23917	**65165**	**0**	Physical range check high for DV1 & DV2 upstream pressure; shut off regeneration
		1	Physical range check low for DV1 & DV2 upstream pressure; shut off regeneration
		2	Sensor DV1 & DV2 upstream pressure; plausibility error
		3	Sensor error DV1 & DV2 upstream pressure; signal range check high
		4	Sensor error DV1 & DV2 upstream pressure; signal range check low
23918	**65166**	**0**	Physical range check high for DV1 & DV2 upstream temperature; shut off regeneration
		1	Physical range check low for DV1 & DV2 upstream temperature; shut off regeneration
		2	Sensor DV1 & DV2 upstream temperature; plausibility error
		3	Sensor error DV1 & DV2 upstream temperature; signal range check high
		4	Sensor error DV1 & DV2 upstream temperature; signal range check low

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
23919	**65167**	**0**	Physical range check high for airpump pressure; shut off regeneration
		1	Physical range check low for airpump pressure; shut off regeneration
		2	Sensor airpump pressure; plausibility error
		3	Sensor error airpump pressure; signal range check high
		4	Sensor error airpump pressure; signal range check low
23920	**65168**	**0**	Physical range check high for exhaustgas back pressure burner; shut off regeneration
		1	Physical range check low for exhaustgas back pressure burner; shut off regeneration
		2	Sensor exhaustgas back pressure; plausibility error
		3	Sensor error exhaustgas back pressure burner; signal range check high
		4	Sensor error exhaustgas back pressure burner; signal range check low
23921	**65169**	**0**	Physical range check high for burner temperature
		1	Physical range check low for burner temperature
		2	Sensor burner temperature; plausibility error
		3	Sensor error burner temperature; signal range check high
		4	Sensor error burner temperature; signal range check low
		11	Sensor burner temperature; plausibility error
23922	**65170**	**3**	Burner shut of valve; short circuit to battery
		4	Burner shut of valve; short circuit to ground
		5	Burner shut off valve; open load
		7	Shut off valve: blocked
		12	Over temperature error on burner shut of valve
23929	**65177**	**0**	Fuel Balance Control integrator injector 1 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 1 (in firing order); minimum value exceeded
23930	**65178**	**0**	Fuel Balance Control integrator injector 2 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 2 (in firing order); minimum value exceeded

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SPN	ASPN	FMI	Description
23931	**65179**	**0**	Fuel Balance Control integrator injector 3 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 3 (in firing order); minimum value exceeded
23932	**65180**	**0**	Fuel Balance Control integrator injector 4 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 4 (in firing order); minimum value exceeded
23933	**65181**	**0**	Fuel Balance Control integrator injector 5 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 5 (in firing order); minimum value exceeded
23934	**65182**	**0**	Fuel Balance Control integrator injector 6 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 6 (in firing order); minimum value exceeded
23935	**65183**	**12**	Timeout Error of CAN-Transmit-Frame EEC3VOL1; Engine send messages
23936	**65184**	**12**	Timeout Error of CAN-Transmit-Frame EEC3VOL2; Engine send messages
23938	**65186**	**9**	Timeout Error (BAM to packet) for CAN-Receive-Frame AT1IGCVol1 information; factors & Sensorcalibration for NOX Sensor (SCR-system upstream cat; DPF- system downstream cat)
23939	**65187**	**9**	Timeout Error (BAM to BAM) for CAN-Receive-Frame AT1IGCVol1 information; factors & Sensorcalibration for NOX Sensor (SCR-system upstream cat; DPF- system downstream cat)
23940	**65188**	**9**	Timeout Error (PCK2PCK) for CAN-Receive-Frame AT1IGCVol1 information; factors & Sensorcalibration for NOX Sensor (SCR-system upstream cat; DPF-system downstream cat)

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
23941	**65189**	**9**	Timeout Error (BAM to packet) for CAN-Receive-Frame AT1OGCVol2 information; factors & Sensorcalibration for NOX Sensor (SCR-system downstream cat; DPF-system downstream cat)
23942	**65190**	**9**	Timeout Error (BAM to BAM) for CAN-Receive-Frame AT1OGCVol2 information; factors & Sensorcalibration for NOX Sensor (SCR-system downstream cat; DPF- system downstream cat)
53943	**65191**	**9**	Timeout Error (PCK2PCK) for CAN-Receive-Frame AT1OGCVol2 information; factors & Sensorcalibration for NOX Sensor (SCR-system downstream cat; DPF- system downstream cat)
23946	**65194**	**0**	Zerofuel calibration injector 1 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 1 (in firing order); minimum value exceeded
23947	**65195**	**0**	Zerofuel calibration injector 2 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 2 (in firing order); minimum value exceeded
23948	**65196**	**0**	Zerofuel calibration injector 3 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 3 (in firing order); minimum value exceeded
23949	**65197**	**0**	Zerofuel calibration injector 4 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 4 (in firing order); minimum value exceeded
23950	**65198**	**0**	Zerofuel calibration injector 5 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 5 (in firing order); minimum value exceeded
23951	**65199**	**0**	Zerofuel calibration injector 6 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 6 (in firing order); minimum value exceeded
23960	**65208**	**0**	EGR cooler downstream temperature; out of range, system reaction initiated Exhaust gas temperature EGR downstream; out of range, system reaction initiated
		1	EGR cooler downstream temperature; out of range, system reaction initiated Exhaust gas temperature EGR downstream; out of range, system reaction initiated
23973	**65221**	**14**	SCR Tamper detection; derating timer below limit 1
23974	**65222**	**14**	SCR Tamper detection; derating timer below limit 2

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SPN = Suspect Parameter Number
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SPN	ASPN	FMI	Description
23975	**65223**	**14**	Urea quality; derating timer below limit 1
23976	**65224**	**14**	Urea qulaity; derating timer below limit 2
23977	**65225**	**14**	Urea tank level; derating timer below limit 1
23978	**65226**	**14**	Urea tank level; derating timer below limit 2
23980	**65228**	**14**	Bad quality of reduction agent detected
23981	**65229**	**11**	Urea-tank without heating function (heating phase)
23982	**65230**	**0**	Powerstage diagnosis disabled; high battery voltage
		1	Powerstage diagnosis disabled; low battery voltage
23988	**65236**	**3**	Charging lamp; short circuit to battery
		4	Charging lamp; short circuit to ground
		5	Charging lamp; open load
		12	Charging lamp; over temperature
23989	**65237**	**0**	Fuel Balance Control integrator injector 7 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 7 (in firing order); minimum value exceeded
23990	**65238**	**0**	Fuel Balance Control integrator injector 8 (in firing order); maximum value exceeded
		1	Fuel Balance Control integrator injector 8 (in firing order); minimum value exceeded
23992	**65240**	**9**	Timeout Error of CAN-Receive-Frame DM19Vol1; NOX sensor upstream
23993	**65241**	**9**	Timeout Error of CAN-Receive-Frame DM19Vol2; NOX sensor downstream
23995	**65243**	**13**	check of missing injector adjustment value programming (IMA) injector 7 (in firing order)
23996	**65244**	**13**	check of missing injector adjustment value programming (IMA) injector 8 (in firing order)

ENGINE FAULT CODES - MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
ASPN = Alternate Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	ASPN	FMI	Description
23998	**65246**	**4**	Injector cylinder bank 2 slave; short circuit
23999	**65247**	**12**	Injector powerstage output Slave defect
24000	**65248**	**3**	Injector 7 (in firing order); short circuit
		4	High side to low side short circuit in the injector 7 (in firing order)
		5	Injector 7 (in firing order); interruption of electric connection
24001	**65249**	**3**	Injector 8 (in firing order); short circuit
		4	High side to low side short circuit in the injector 8 (in firing order)
		5	Injector 8 (in firing order); interruption of electric connection
24004	**65252**	**12**	Too many recognized misfires in cylinder 7 (in firing order)
24005	**65253**	**12**	Too many recognized misfires in cylinder 8 (in firing order)
24011	**65259**	**0**	Zerofuel calibration injector 7 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 7 (in firing order); minimum value exceeded
24012	**65260**	**0**	Zerofuel calibration injector 8 (in firing order); maximum value exceeded
		1	Zerofuel calibration injector 8 (in firing order); minimum value exceeded
24013	**65261**	**7**	Burner operation disturbed
24014	**65262**	**1**	Air pressure glow plug flush line; below limit
24016	**65264**	**2**	Air Pump; air flow is not plausible
		11	HFM sensor; electrical fault
24017	**65265**	**12**	Spark plug control unit (SPCU); internal error
24018	**65266**	**14**	DPF wasn´t regenerated, power reduction phase 1 (manuell regeneration request)
24019	**65267**	**11**	Air Pump; air lines blocked
24020	**65268**	**14**	Engine power; Not enough oxygen for regeneration
24021	**65269**	**11**	Burner fuel line pipe leak behind Shut Off Valve
24022	**65270**	**14**	DPF wasn´t regenerated, power reduction phase 2 (manuell regeneration request)
24023	**65271**	**14**	DPF wasn´t regenerated, warning condition (manuell regeneration mode)
24024	**65272**	**11**	Deviation of the exhaust gas temperature setpoint to actual value downstream (DOC) too high
24025	**65273**	**5**	DPF system; operating voltage error
		14	Particulate filter; regeneration not succesful
24028	**65276**	**2**	CAN message PROEGRActr; plausibility error
24029	**65277**	**2**	Timeout Error of CAN-Receive-Frame ComEGRActr - exhaust gas recirculation positioner

ENGINE FAULT CODES -
MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
ASPN = Alternate Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	ASPN	FMI	Description
24030	**65278**	**7**	EGR actuator; internal error
24031	**65279**	**13**	EGR actuator; calibration error
24032	**65280**	**2**	EGR actuator; status message "EGRCust" is missing
24033	**65281**	**7**	EGR actuator; due to overload in Save Mode
24034	**65282**	**3**	Disc separator; short circuit to battery
		4	Disc separator; short circuit to ground
		5	Disc Separator; open load
		12	Disc Separator; powerstage over temperature
24035	**65283**	**12**	Injector diagnostics; time out error in the SPI communication
24036	**65284**	**12**	Injector diagnostics Slave; time out error in the SPI communication
24037	**65285**	**3**	Ashlamp; short circuit to battery
		4	Ashlamp; short circuit to ground
		5	Ashlamp; open load
24038	**65286**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys1TO (error memory Slave); Master-Slave internal CAN message
24039	**65287**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys2TO (error memory Slave); Master-Slave internal CAN message
24040	**65288**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys3TO (error memory Slave); Master-Slave internal CAN message
24041	**65289**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys4TO (error memory Slave); Master-Slave internal CAN message
24042	**65290**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys5TO (error memory Slave); Master-Slave internal CAN message
24043	**65291**	**9**	Timeout error of CAN-Receive-Frame ComMS_Sys6TO (error memory Slave); Master-Slave internal CAN message
24044	**65292**	**9**	CAN message ComMS_Sys7 not received from slave

ENGINE FAULT CODES - MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
ASPN = Alternate Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	ASPN	FMI	Description
24045	**65293**	**9**	Master-Slave CAN; Message-Counter-Error of CAN-Receive-Frame ComMSMoFOvR
24046	**65294**	**9**	Master-Slave CAN; Checksum-Error of CAN-Receive-Frame ComMSMoFOvR
24047	**65295**	**9**	Master-Slave CAN; Messsage-Length-Error of CAN-Receive-Frame ComMSMoFOvR
24048	**65296**	**9**	Timeout error CAN message ComMSMoFOvR1TO error memory Slave
24049	**65297**	**9**	Message copy error in the Master / Slave data transfer
24052	**65300**	**11**	MS ECU reported internal error
24055	**65303**	**4**	Spark Plug Control Unit (SPCU); short circuit to ground
24057	**65305**	**2**	Electric fuel pump; fuel pressure build up error
24062	**65310**	**12**	EAT-system HMI disrupted
24068	**65316**	**2**	Master ECU and Slave ECU have been identified as the same types
24069	**65317**	**9**	Timeout Error of CAN-Receive-Frame MSMon_FidFCCTO; Master-Slave CAN communication faulty
24097	**65345**	**9**	Timeout error of CAN-Transmit-Frame DPFBrnAirPmpCtl
24098	**65346**	**9**	Timeout error of CAN-Transmit-Frame ComDPFBrnPT
24099	**65347**	**9**	Timeout error of CAN-Transmit-Frame ComDPFC0
24100	**65348**	**9**	Timeout error of CAN-Transmit-Frame ComDPFHisDat
24101	**65349**	**9**	Timeout error of CAN-Transmit-Frame ComDPFTstMon
24102	**65350**	**9**	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmpCtl
24103	**65351**	**9**	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmp
24104	**65352**	**9**	Timeout error of CAN-Receive-Frame ComRxDPFCtl

ENGINE FAULT CODES -
MODELS WITH DEUTZ POWER

SPN = Suspect Parameter Number
ASPN = Alternate Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	ASPN	FMI	Description
24105	**65353**	**9**	Timeout error of CAN-Transmit-Frame ComEGRMsFlw
24106	**65354**	**9**	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw1
24107	**65355**	**9**	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw2
24108	**65356**	**9**	Timeout error of CAN-Transmit-Frame ComEGRTVActr
24109	**65357**	**9**	Timeout error of CAN-Receive-Frame ComRxEGRTVActr
24110	**65358**	**9**	Timeout error of CAN-Transmit-Frame ComETVActr
24111	**65359**	**9**	Timeout error of CAN-Receive-Frame ComRxETVActr
24112	**65360**	**9**	Timeout ComITVActr
24113	**65361**	**9**	Timeout error of CAN-Receive-Frame ComRxITVActr
24114	**65362**	**9**	Timeout error of CAN-Transmit-Frame A1DOC
24115	**65363**	**9**	Timeout error of CAN-Transmit-Frame AT1S
24116	**65364**	**9**	Timeout error of CAN-Transmit-Frame SCR2
24117	**65365**	**9**	Timeout error of CAN-Transmit-Frame SCR3
24118	**65366**	**9**	Timeout error of CAN-Receive-Frame ComRxCM0
24119	**65367**	**9**	Timeout error of CAN-Receive-Frame ComRxCustSCR2
24120	**65368**	**9**	Timeout error of CAN-Receive-Frame ComRxSCRHtDiag
24121	**65369**	**9**	Timeout error of CAN-Receive-Frame ComRxTrbChActr
24122	**65370**	**9**	Timeout error of CAN-Receive-Frame ComRxUQSens
24123	**65371**	**9**	Timeout error of CAN-Receive-Frame ComSCRHtCtl
24124	**65372**	**9**	Timeout error of CAN-Receive-Frame ComTxAT1IMG
24125	**65373**	**9**	Timeout error of CAN-Receive-Frame ComTxTrbChActr

Engine Fault Codes - Models with Perkins Power

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
91	2	Incorrect throttle switch inputs
	3	Throttle position sensor: voltage above normal or shorted high
	4	Throttle position sensor: voltage below normal or shorted low
	8	Throttle position sensor: abnormal frequency, pulse width or period
100	3	Engine oil pressure sensor: voltage above normal or shorted high
	4	Engine oil pressure sensor :voltage below normal or shorted low
102	3	Boost pressure sensor voltage: voltage above normal or shorted high
	4	Boost pressure sensor voltage: voltage below normal or shorted low
	10	No 5V to sender
105	3	Intake manifold temperature sensor: temperature above normal or shorted high
	4	Intake manifold temperature sensor: temperature below normal or shorted low
105	3	Intake manifold air temperature open/short to battery positive (+)
	4	Intake manifold air temperature short to ground
110	3	Engine coolant temperature open/short to battery positive (+)
	4	Engine coolant temperature short to ground
157	3	Fuel rail pressure open/short to battery positive (+)
	4	Fuel rail pressure short to ground
168	0	System voltage high
	1	System voltage low
	2	ECM battery power intermittent/erratic
172	3	Air inlet temperature voltage high
	4	Air inlet temperature voltage low
174	2	Fuel temperature sensor: data erratic/intermittent or incorrect
190	8	Engine speed signal abnormal
	15	Engine speed: overspeed WARNING
190	0	Engine overspeed
626	5	Ether start aid current low
	6	Ether start aid current high
630	2	System parameters incorrect
631	2	Personality module mismatch
637	11	Engine timing calibration invalid

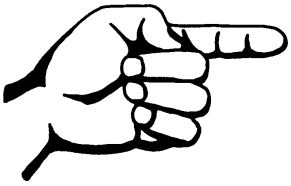
ENGINE FAULT CODES - MODELS WITH PERKINS POWER

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
637	139	Engine timing calibration required
639	9	J1939 data link communications
	12	J1939 data link malfunction
651	2	Cylinder #1 injector data incorrect
	5	Cylinder #1 injector open circuit
	6	Cylinder #1 injector short
	7	Cylinder #1 injector not responding
652	2	Cylinder #2 injector data incorrect
	5	Cylinder #2 injector open circuit
	6	Cylinder #2 injector short
	7	Cylinder #2 injector not responding
653	2	Cylinder #3 injector data incorrect
	5	Cylinder #3 injector open circuit
	6	Cylinder #3 injector short
	7	Cylinder #3 injector not responding
654	2	Cylinder #4 injector data incorrect
	5	Cylinder #4 injector open circuit
	6	Cylinder #4 injector short
	7	Cylinder #4 injector not responding
678	3	8V DC supply short to battery positive (+)
	4	8V DC supply shorted to ground
723	8	Secondary engine speed signal abnormal
1188	5	Turbo wastegate drive current low
1196	9	Machine security system module non-communication
1347	5	Fuel rail pump output current low
	6	Fuel rail pump output current high
	7	Fuel rail pressure valve solenoid not responding
2882	2	Mode selector switch: data erratic/intermittent or incorrect
3509	3	5V DC power supply sensor short to battery positive (+)
3509	4	5V DC power supply sensor short to ground

For further engine fault code troubleshooting and diagnostic information, refer to the *Perkins 1100 Troubleshooting Manual* (Perkins part number SENR9982-01).

Perkins 1100 Troubleshooting Manual
Genie part number 123583



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Schematics

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

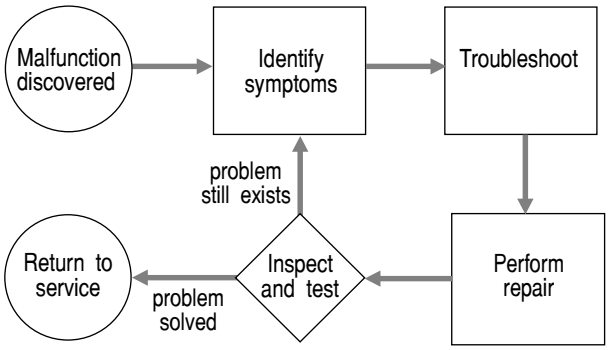
Electrical Schematics

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

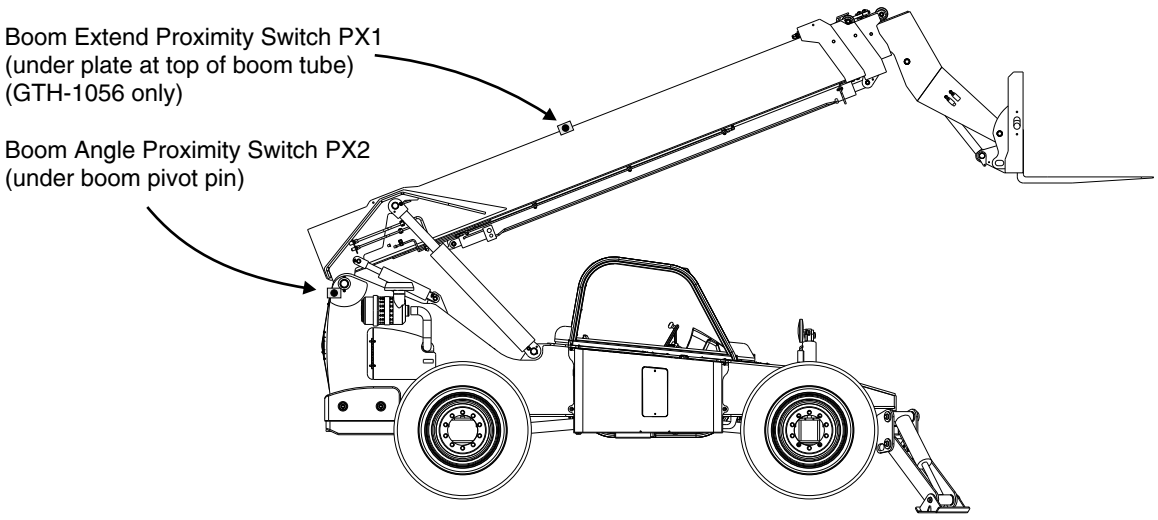
Hydraulic Schematics

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

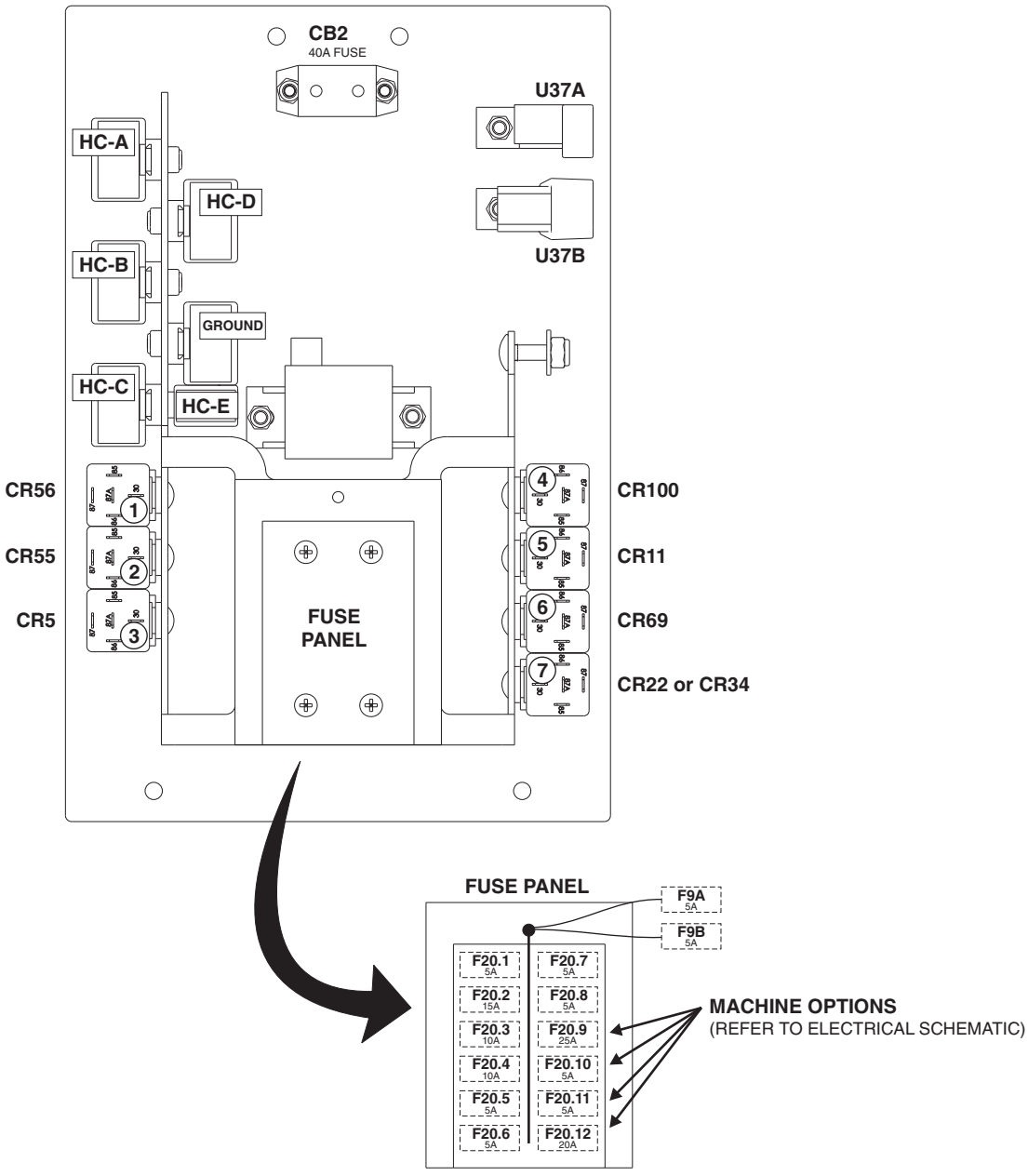
General Repair Process



Proximity Switch Layout

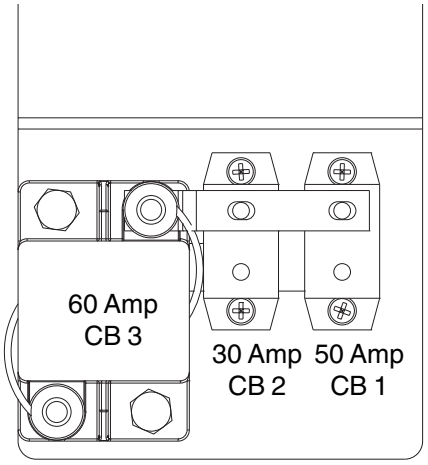

Boom Extend Proximity Switch PX1
(under plate at top of boom tube)
(GTH-1056 only)
Boom Angle Proximity Switch PX2
(under boom pivot pin)

Fuse Box Layout
(before serial number GTH1012-16292)

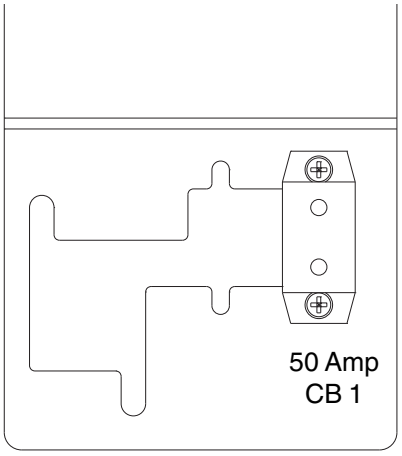


PCB Board Fuse Panel located in the Cab

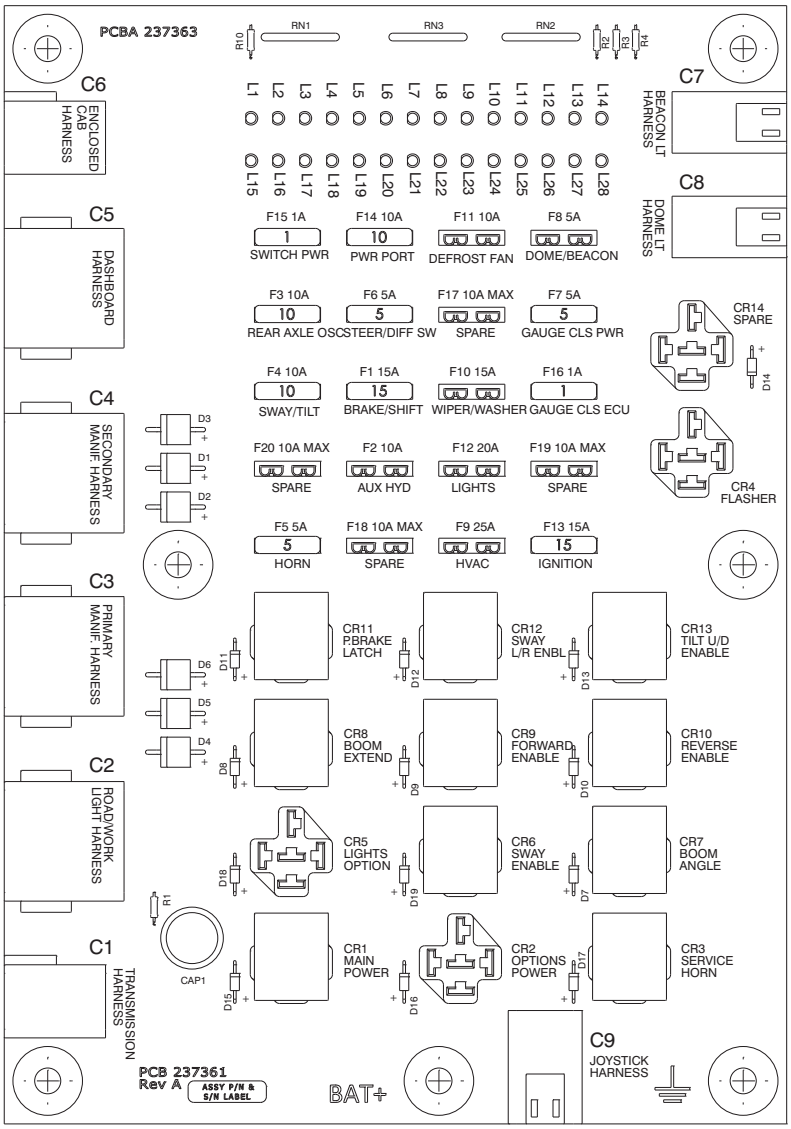
Fuse Box Layout
(from serial number GTH1012-16292)



Perkins Engine Circuit Breakers
Located in Tank Assembly

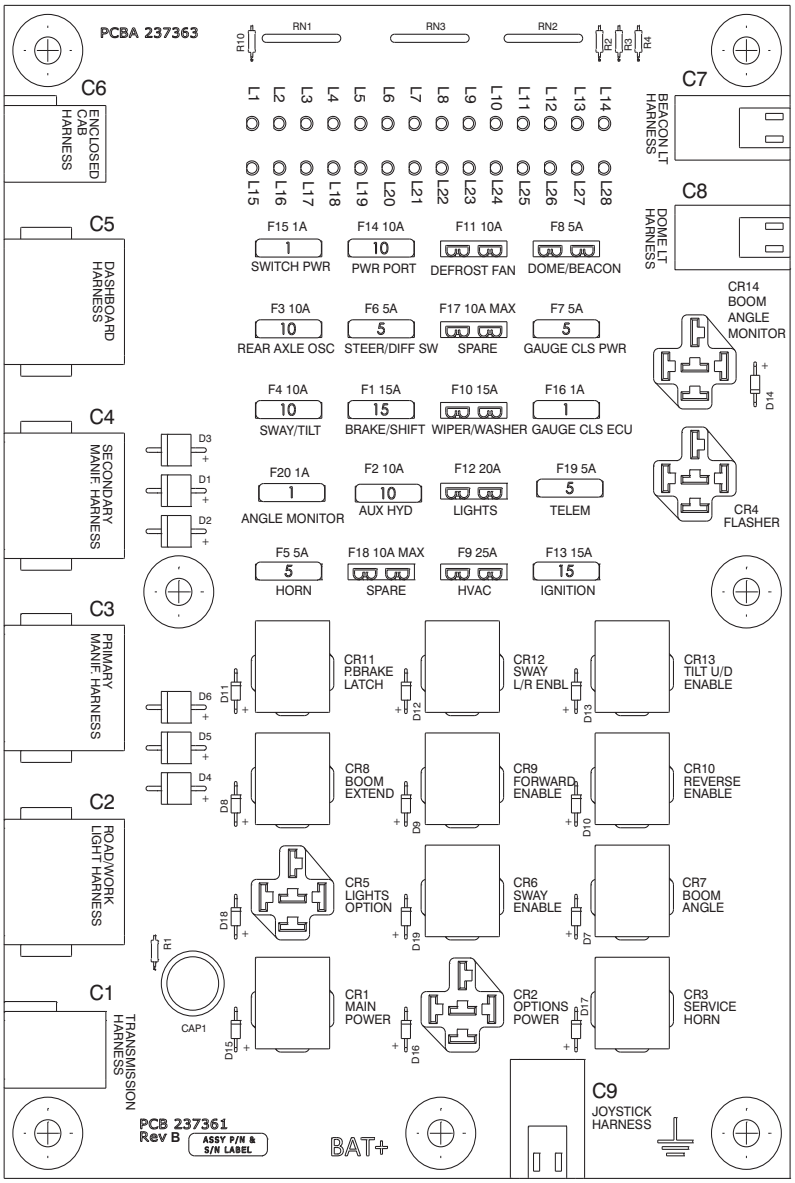


John Deere Engine Circuit Breakers
Located in Tank Assembly

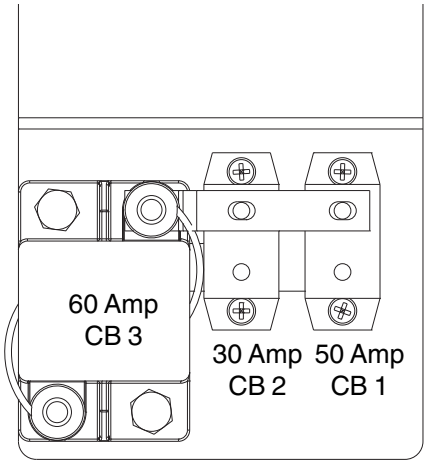


PCB Board Fuse Panel located in the Cab

Fuse Box Layout
(from serial number GTH1014E-10353)



PCB Board Fuse Panel located in the Cab



Perkins Engine Circuit Breakers
Located in Tank Assembly

Electrical Component Legend
(before serial number GTH1012-16292)

Abbreviation Legend

B1	Battery
CB2	Circuit Breaker, 40A
C5	Capacitor, 4700mf
CR	Control relay
	CR5 = Horn
	CR11 = Boom up
	CR55 = Drive reverse
	CR56 = Drive forward
	CR69 = Boom extend
	CR88 = Power
	CR89 = Parking brake
	CR100 = Sway enable
D1	Alternator
F	Fuse
	F6 = 20A, Power to controls
	F19 = 10A, ECM power
	F20 = Fuse block
FS2	Throttle pedal
G	Gauge
	G3 = Engine coolant temperature
	G6 = Hourmeter
	G8 = Diagnostic display
	G11 = Fuel level
	G12 = Tachometer
H	Horn
	H2 = Auto-style horn
	H5 = Multifunction alarm
KS1	Key switch

L	Light
	L7 = Low battery
	L42 = Engine oil pressure
	L61 = Back up light
	L63 = Low brake pressure
	L64 = Parking brake on
	L71 = Transmission oil pressure
	L72 = Transmission temperature
	L73 = Low fuel level
	L74= 4-wheel steer select
	L75 = Crab steer select
	L76 = 2-wheel steer select
M	Motor
	M3 = Engine starter
	M9 = Heater fan motor
	M10 = Windshield wiper motor
	M11 = Cab circulation fan motor
PS	M12 = Windshield washer motor
	Pressure switch
	PS4 = Service brake
	PS6 = Parking brake
	PS7 = Low brake pressure
	PS8 = Sway
PX	Proximity switch
	PX1 = Boom extend
	PX2 = Boom angle
S	Sensor
	S1 = Engine coolant temperature
	S2 = Engine oil pressure
	S11 = Transmission oil temperature
	S12 = Transmission oil pressure
	S13 = Fuel level

SW	Switch
	SW23 = Transmission control
	SW24 = Parking brake
	SW34 = Sway enable
	SW35 = Auxiliary control
	SW39 = Right outrigger
	SW40 = Left outrigger
	SW42 = Tilt enable
	SW43 = Steer select
	SW44 = Horn
	SW77 = Differential lock
U	Electrical component
	U31 = Engine ECM
	U37 = Diode
Y	Valve coil
	Y5 = Transmission reverse
	Y6 = Transmission forward
	Y55 = Rear axle oscillate enable
	Y67 = Parking brake release
	Y68 = Differential lock
	Y70 = Sway left enable
	Y71 = Sway right enable
	Y72 = Tilt
	Y73 = Right outrigger extend
	Y74 = Right outrigger retract
	Y75 = Left outrigger extend
	Y76 = Left outrigger retract
	Y77 = Auxiliary
	Y78 = 4-wheel steer select
	Y79 = Crab steer select
	Y80 = Transmission "D"
	Y81 = Transmission "E"
	Y82 = Sway enable
	Y83 = Rear axle oscillate fast

Electrical Component Legend
(from serial number GTH1012-16292)

Electrical Component & Wire Color Abbreviation Legend

ALT	Alternator	
B	Battery	
	B1	Main Battery
CB	Circuit Breaker	
	CB1	50 Amp Circuit Breaker
	CB2	30 Amp Circuit Breaker
	CB3	60 Amp Circuit Breaker
C	Capacitor	
	C1	4700 uf
CR	Control Relay	
	CR1	Main Power
	CR2	Options Power
	CR3	Service Horn
	CR4	Flasher
	CR5	Lights Option
	CR6	Sway Enable
	CR7	Boom Angle
	CR8	Boom Extend
	CR9	Forward Enable
	CR10	Reverse Enable
	CR11	Parking Brake Latch
	CR12	Sway Left/Right Enable
	CR13	Tilt Up/Down Enable
	CR15	HVAC Blower L
	CR16	HVAC Blower M
	CR17	HVAC Blower H
D	Diode	
ECU	Engine Control Unit	
F	Fuse	
	F1	15 Amp - Break/Shift
	F2	10 Amp - Aux Hydraulics
	F3	10 Amp – Rear Axle Oscillate
	F4	10 Amp – Sway/Tilt
	F5	5 Amp - Horn
	F6	5 Amp - Steer/Differential Switch
	F7	5 Amp - Gauge Cluster Power
	F8	5 Amp - Dome/Beacon Light
	F9	25 Amp – HVAC
	F10	15 Amp – Windshield Wiper/Washer
	F11	10 Amp – Defrost Fan
	F12	20 Amp – Lights
	F13	15 Amp – Ignition
	F14	10 Amp – Power Port
	F15	1 Amp - Switch Power
	F16	1 Amp – Gauge Cluster ECU
	F17	Spare
	F18	Spare
	F21	HVAC Control Panel

L	LED Light		
	L1	Ignition Power	ON
	L2	Options Power Relay	ON
	L3	Horn Relay	ON
	L4	Turn Signal	ON
	L5	Road Lights, Work Lights	ON
	L6	Sway Enable Coil Power	ON
	L7	Boom Angle	ON
	L8	Boom Extend	ON
	L9	Brake Pressure	ON
	L10	Backup Light, Alarm	ON
	L11	Parking Brake Latch	ON
	L12	Sway Enable	ON
	L13	Tilt Circuit Power	ON
	L14	Horn Power	ON
	L15	Cab, Tail Light Power	ON
	L16	Rear Axle Float Coil Power	ON
	L17	Rr Ax Fast Power (GTH1056)	ON
	L18	Parking Brake Power	ON
	L19	Forward Coil Power	ON
	L20	Reverse Coil Power	ON
	L21	PB Release Coil Power	ON
	L22	Sway L/R Enable Coil Power	ON
	L23	Tilt U/D Enable Coil Power	ON
	L24	Forward Shift	ON
	L25	Parking Brake Release	OFF
	L26	Brake Light Power	ON
	L27	Hazard Power	ON
	L28	Not Used	
M	Motor		
R	Resistor		
S	Switch		
	S1	Key Start Switch	
	S2	Parking Brake Switch	
	S3	Boom Angle Switch	
	S4	Boom Extend Switch	
	S5	Parking Brake Pressure Switch	
	S6	Service Brake Pressure Switch	
	S7	Sway Enable Pressure Switch	
	S8	Sway Enable Switch	
	S9	Tilt Enable Switch	
	S10	Steer Select Switch	
	S11	Left Stabilizer Switch	
	S12	Right Stabilizer Switch	
	S13	Differential Lock Switch	
	S14	Auxiliary Cont. Switch	
	S15	Horn Switch	
	S16	Brake Light Pressure Switch	
	S17A	Windshield Wiper Motor Switch	
	S17B	Windshield Washer Switch	
	S18A	Windshield Wiper Motor Switch	
	S18B	Windshield Washer Switch	
	S19	Dome Light Switch	
	S21	Enclosed Cab Fan Switch	
	S22	Road / Work Light Switch	
	S23	Brake Pressure Warning Switch	
	S24	Transmission Oil Pressure Switch	
	S25	Transmission Oil Temp. Switch	

Electrical Component & Wire Color Abbreviation Legend

TP	Throttle Pedal	
TSS	Turn Signal Shifter	
Y	Valve Coil	
	Y70	Sway Left Enable SV1
	Y72A	Tilt Up Enable SV2
	Y71	Sway Right Enable SV3
	Y72B	Tilt Down Enable SV4
	Y67	Parking Brake Release SV5
	Y68	Differential Lock SV6
	Y55	Rear Axle Float SV7
	Y83	Rear Axle Fast SV8
	Y82	Sway Enable SV9
	Y77A	Auxiliary A
	Y77B	Auxiliary B
	Y80	D Transmission
	Y81	E Transmission
	Y6	Transmission Forward
	Y5	Transmission Reverse
	Y78	4Wheel Steer SVD1A
	Y79	Crab Steer SVD1B
	Y75	Left Stabilizer Down
	Y76	Left Stabilizer Up
	Y73	Right Stabilizer Down
	Y74	Right Stabilizer Up
	Y84	AC Control

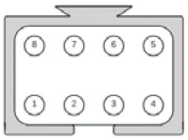
Wire Color Legend

BL	Blue
BL/BK	Blue/Black
BL/RD	Blue/Red
BL/WH	Blue/White
BK	Black
BK/RD	Black/Red
BK/WH	Black/White
BK/YL	Black/Yellow
BR	Brown
GR	Green
GR/BK	Green/Black
GR/WH	Green/White
RD	Red
RD/BK	Red/Black
RD/WH	Red/White
OR	Orange
OR/BK	Orange/Black
OR/RD	Orange/Red
WH	White
WH/BK	White/Black
WH/RD	White/Red

Telematics Connector Legend

Genie installed Telematics connector is wired with an Active High digital input

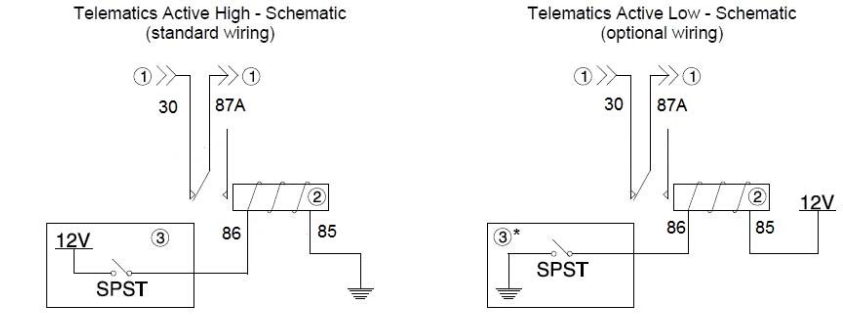
- A Deutsch plug p/n DT06-08SA mates with the Genie Telematics connector



Pin	Circuit Type	Circuit Properties	Genie Machine Function(s)	Telematics Use Case
1	System Power	12 VDC 5 Amp Max. allowed draw	Battery Positive – constant power	Supply power to device
2	System Ground	0 VDC	Battery Negative	Device GND
3	Digital Output 1	12 VDC	Engine Run Hour meter ***12V = engine run, 0V = engine off**	Monitor Engine Hours
4	Digital Output 2	12 VDC	Boom Angle Status ***0V = boom <55^0, 12V = boom >55^0**	Monitor machine utilization
5	Digital Output 3	12 VDC	Parking Brake ***12V = active, 0V = inactive**	Monitor machine utilization
6	Digital Input 1	12 VDC	Remote Machine Disable **** Configurable Active High or Active Low via wiring at the Disable Relay**	Remote Engine Shutdown
7	CAN HIGH	J1939	Databus HIGH J1939	Receive J1939 Engine data
8	CAN LOW	J1939	Databus LOW J1939	Receive J1939 Engine data

Remote Disable Relay Configuration

Telematic device software should monitor that Pin 3 is at 0V before activating Disable Relay



1 Ignition Start Input
2 Relay
3 Telematics with Active High input
3* Telematics with Active Low input

A Deutsch plug p/n DT06-08SA mates with the Genie Telematics connector

Wireless Certifications

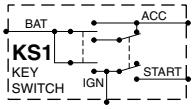
Telematic device(s) should comply with specific wireless carrier certifications where applicable and comply with the following:

N. America – PTCRB, FCC/IC

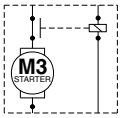
Europe – CE, R&TTE

Electrical and Hydraulic Symbols Legend

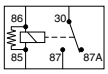
Electrical Schematic Symbols



Key switch



Engine start



Control relay

Alternator

Fuse

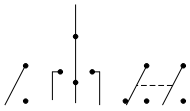
Circuit breaker

Horn or Alarm

Light

Valve coil with diode

Valve coil


Switch

Diode

Proximity switch

Limit switch

Temperature switch

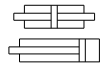
Fuel level sender

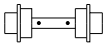
Battery

Pressure switch

Hydraulic Schematic Symbols

Pressure switch


Hydraulic cylinder


Axle

Orifice

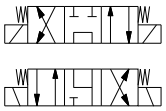
Adjustable orifice

Filter

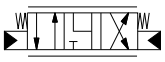
Check valve

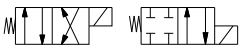
Flow regulator

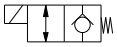
Relief valve

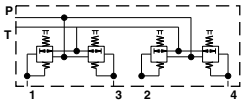

3 position 4 way solenoid valve

2 position 3 way solenoid valve

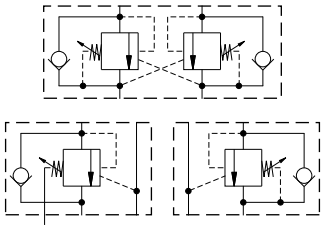

2 position 3 way directional valve, pilot-operated


2 position 4 way solenoid valve


2 position 2 way solenoid valve

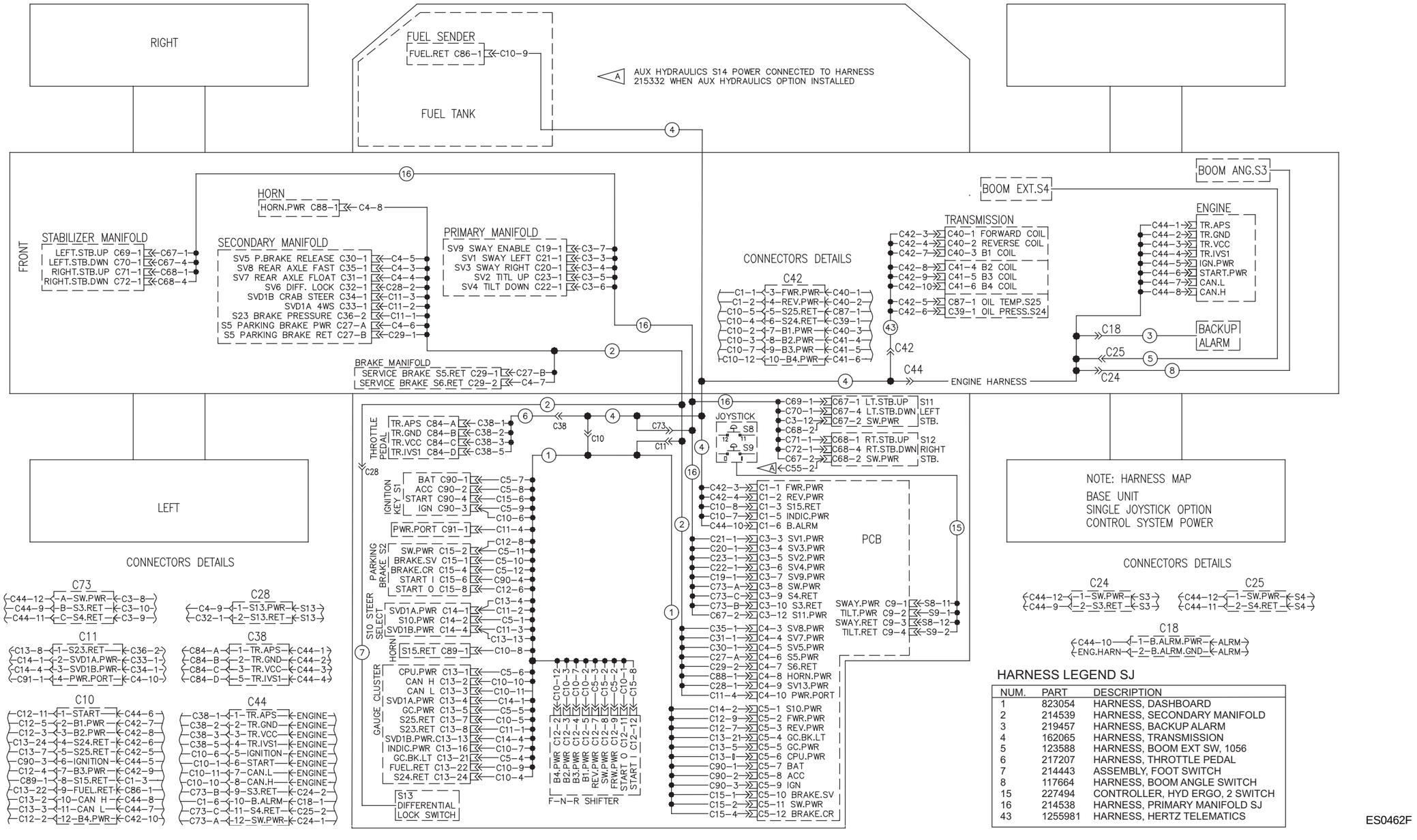


Joystick


Counterbalance valve

Harness Map - Control System Power Single Joystick

Harness Map - Control System Power Single Joystick



HARNESS LEGEND SJ

NUM.	PART	DESCRIPTION
1	823054	HARNESS, DASHBOARD
2	214539	HARNESS, SECONDARY MANIFOLD
3	219457	HARNESS, BACKUP ALARM
4	162065	HARNESS, TRANSMISSION
5	123588	HARNESS, BOOM EXT SW, 1056
6	217207	HARNESS, THROTTLE PEDAL
7	214443	ASSEMBLY, FOOT SWITCH
8	117664	HARNESS, BOOM ANGLE SWITCH
15	227494	CONTROLLER, HYD ERGO, 2 SWITCH
16	214538	HARNESS, PRIMARY MANIFOLD SJ
43	1255981	HARNESS, HERTZ TELEMATICS

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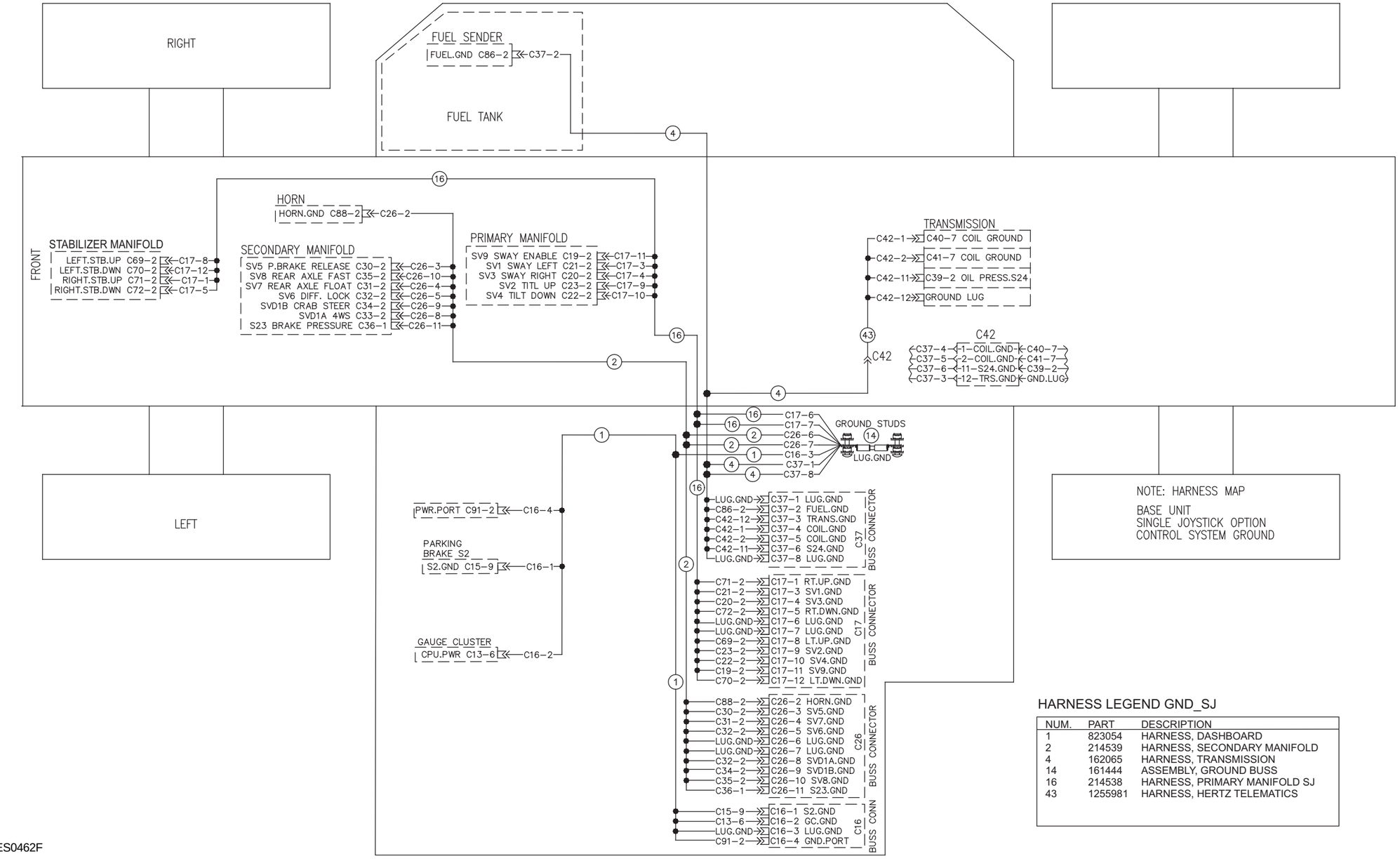
Harness Map - Control System Ground Single Joystick



HARNESS LEGEND GND_SJ

NUM.	PART	DESCRIPTION
1	823054	HARNESS, DASHBOARD
2	214539	HARNESS, SECONDARY MANIFOLD
4	162065	HARNESS, TRANSMISSION
14	161444	ASSEMBLY, GROUND BUSS
16	214538	HARNESS, PRIMARY MANIFOLD SJ
43	1255981	HARNESS, HERTZ TELEMATICS

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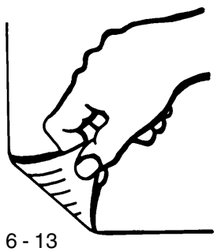
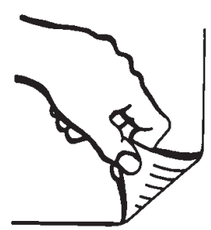
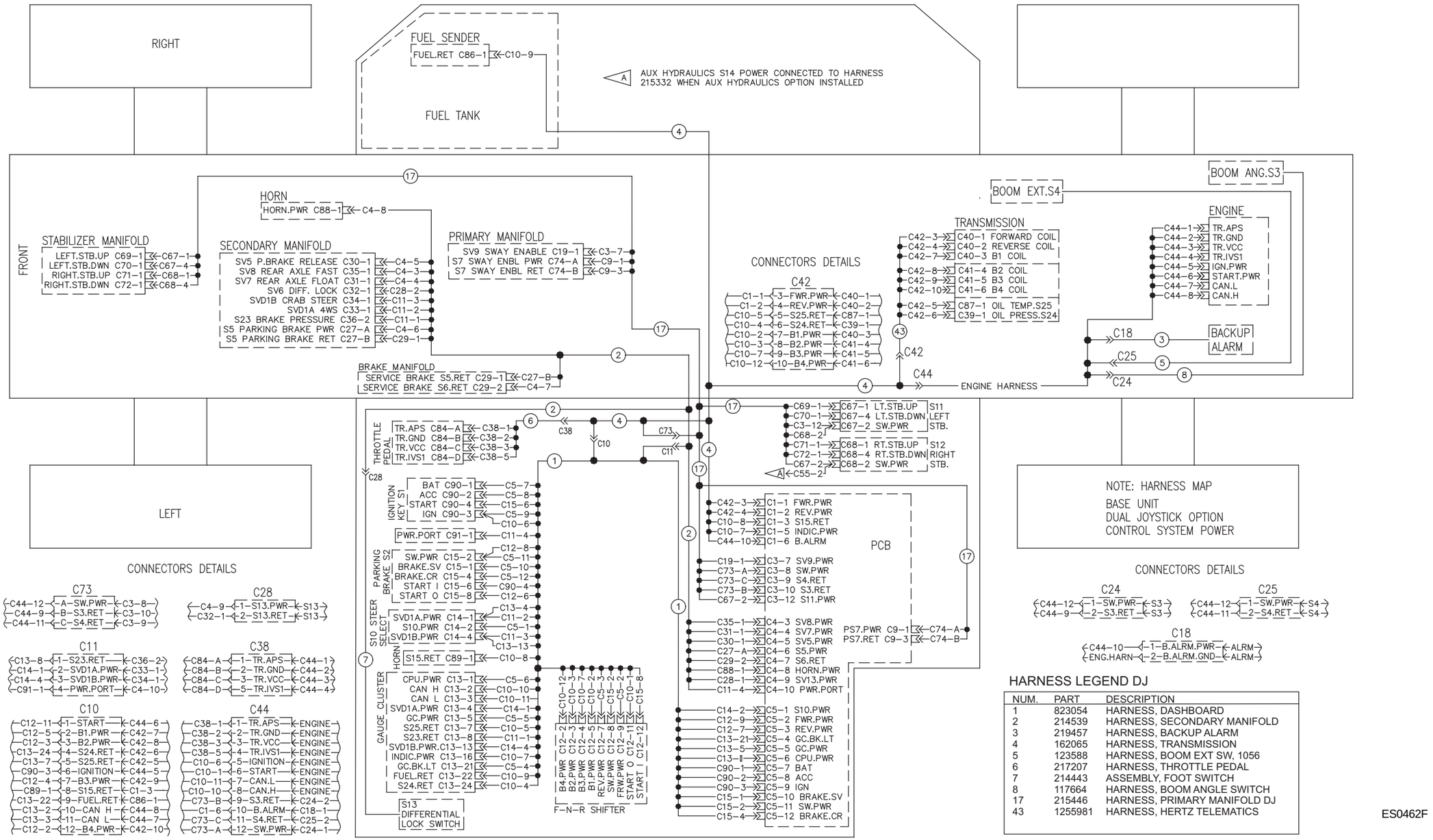
Harness Map - Control System Ground Single Joystick



Harness Map - Control System Power Dual Joystick



Harness Map - Control System Power Dual Joystick



HARNESS LEGEND DJ

NUM.	PART	DESCRIPTION
1	823054	HARNESS, DASHBOARD
2	214539	HARNESS, SECONDARY MANIFOLD
3	219457	HARNESS, BACKUP ALARM
4	162065	HARNESS, TRANSMISSION
5	123588	HARNESS, BOOM EXT SW, 1056
6	217207	HARNESS, THROTTLE PEDAL
7	214443	ASSEMBLY, FOOT SWITCH
8	117664	HARNESS, BOOM ANGLE SWITCH
17	215446	HARNESS, PRIMARY MANIFOLD DJ
43	1255981	HARNESS, HERTZ TELEMATICS

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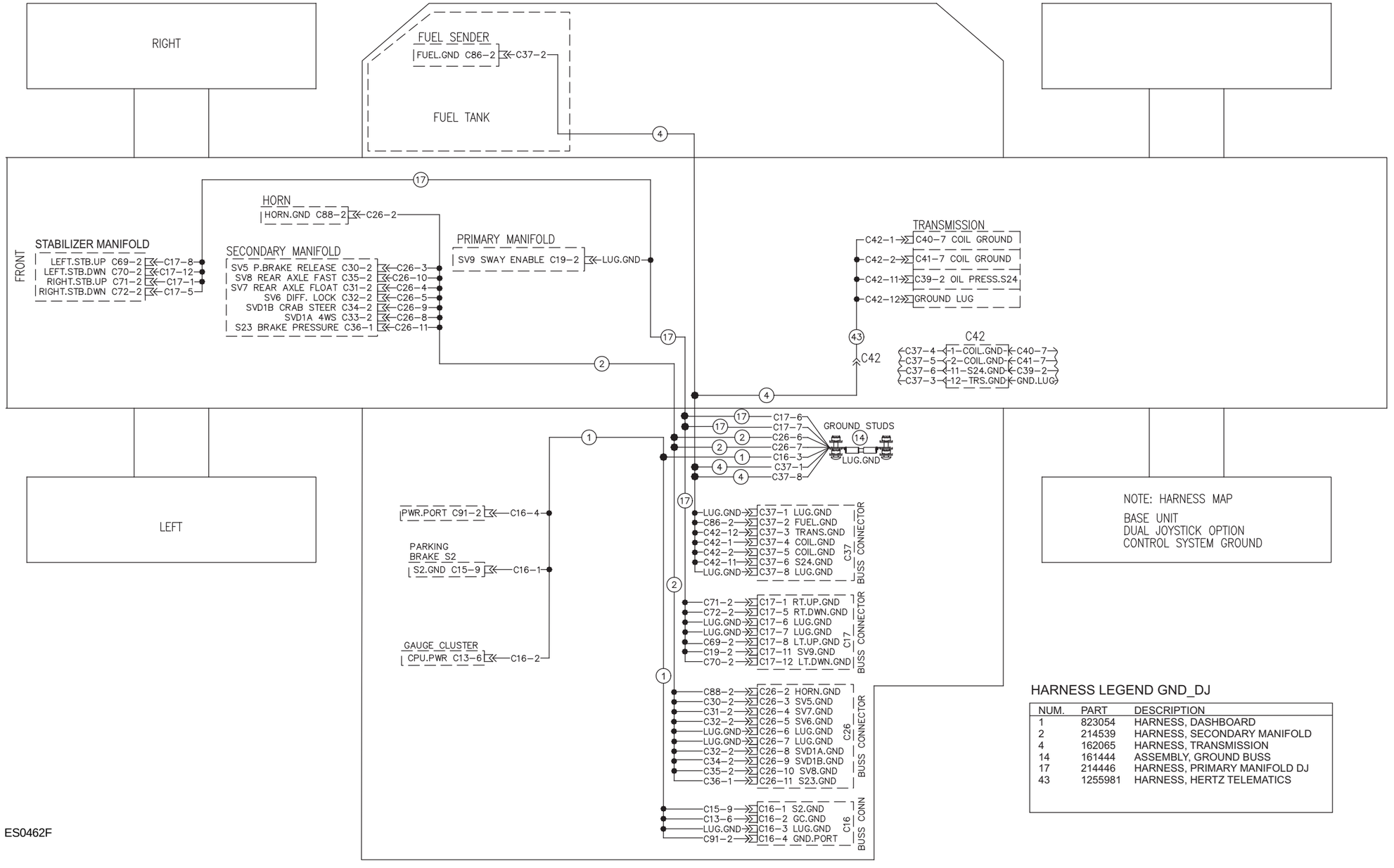
Harness Map - Control System Ground Dual Joystick

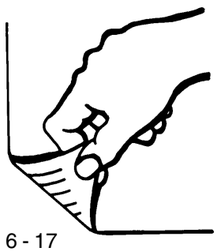


ES0462F

HARNESS LEGEND GND_DJ

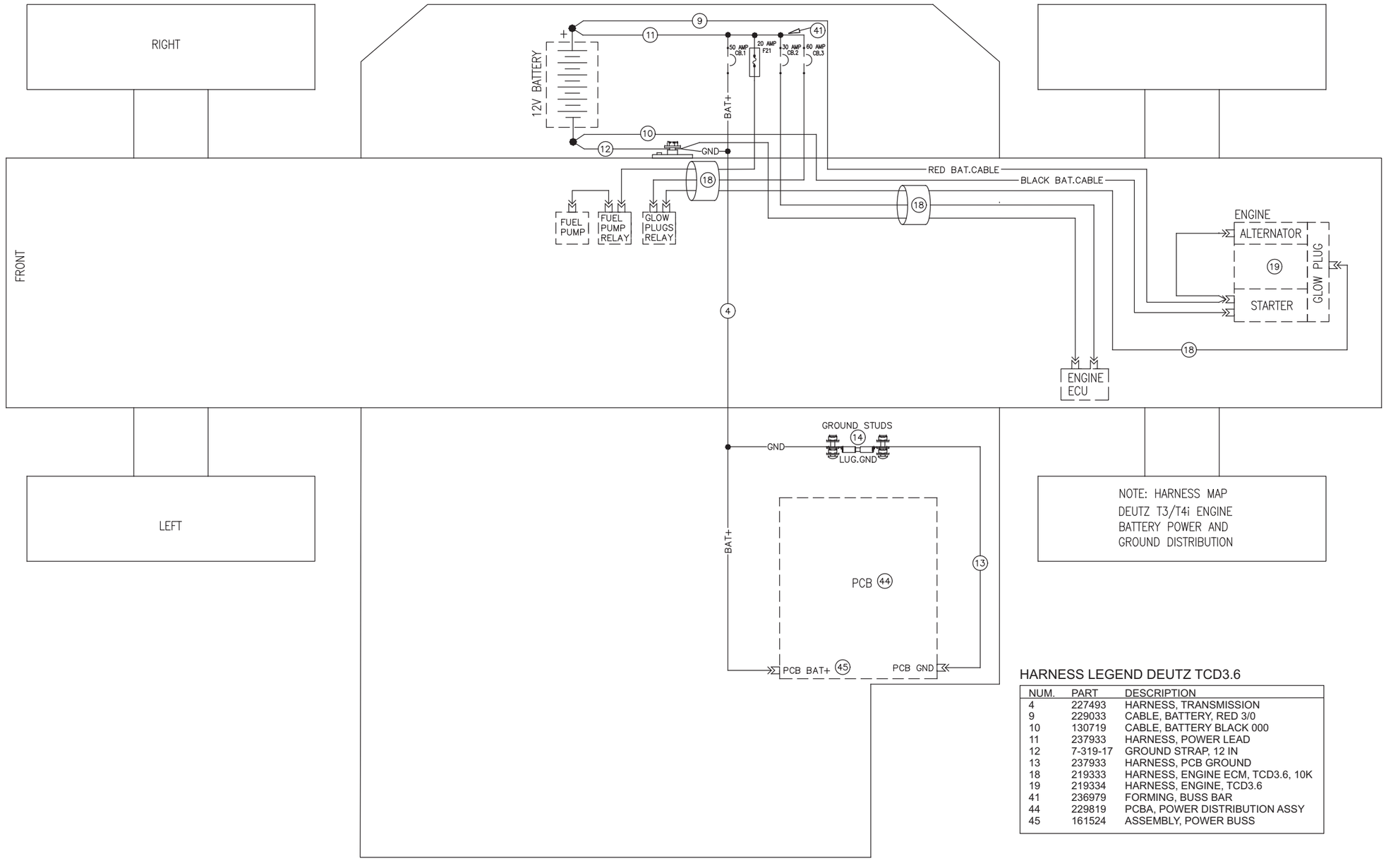
NUM.	PART	DESCRIPTION
1	823054	HARNESS, DASHBOARD
2	214539	HARNESS, SECONDARY MANIFOLD
4	162065	HARNESS, TRANSMISSION
14	161444	ASSEMBLY, GROUND BUSS
17	214446	HARNESS, PRIMARY MANIFOLD DJ
43	1255981	HARNESS, HERTZ TELEMATICS

Harness Map - Control System Ground Dual Joystick



Harness Map - Deutz TCD3.6 Engine
Battery Power and Ground

Harness Map - Deutz 3.6TCD Engine
Battery Power and Ground

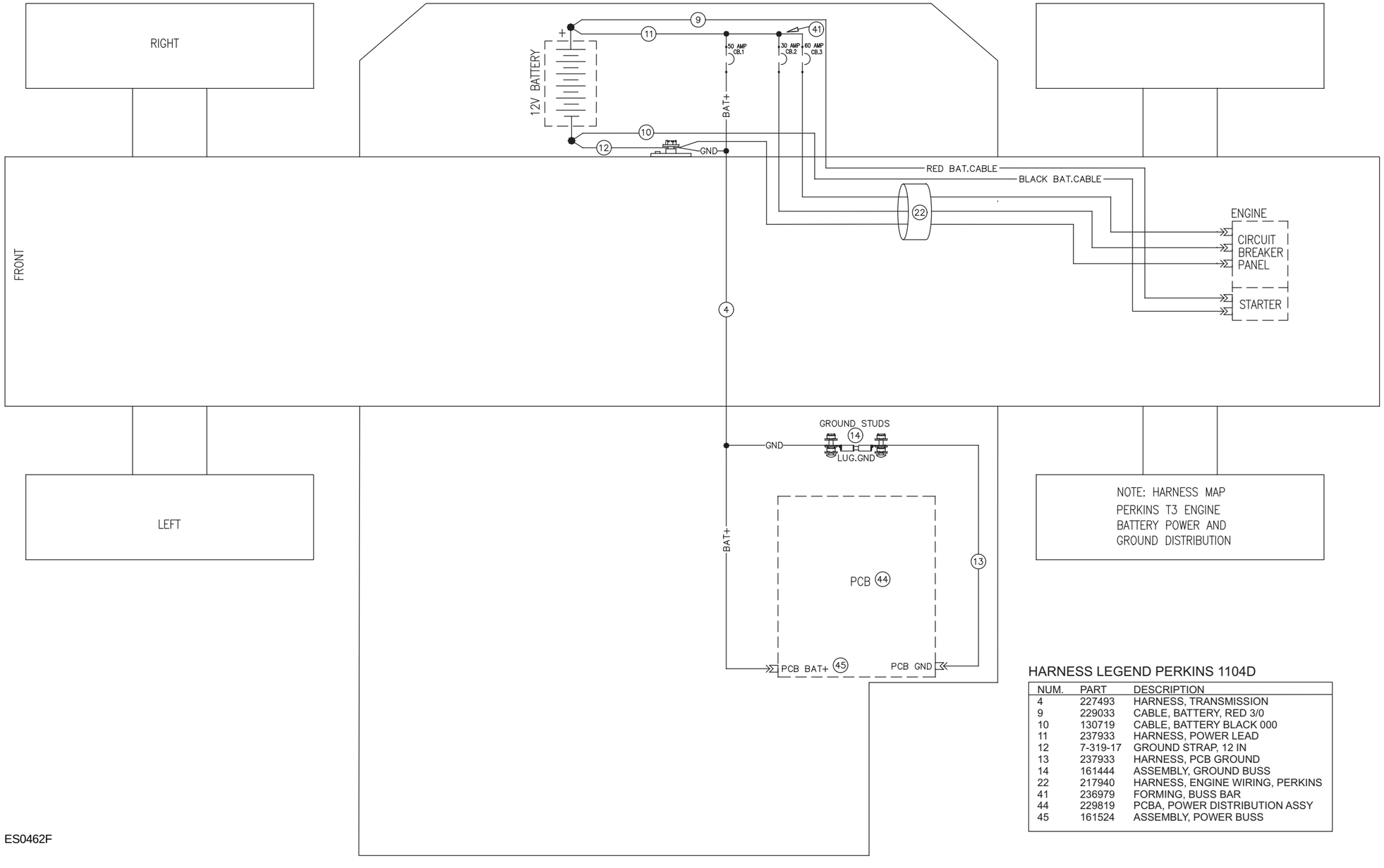


HARNESS LEGEND DEUTZ TCD3.6

NUM.	PART	DESCRIPTION
4	227493	HARNESS, TRANSMISSION
9	229033	CABLE, BATTERY, RED 3/0
10	130719	CABLE, BATTERY BLACK 000
11	237933	HARNESS, POWER LEAD
12	7-319-17	GROUND STRAP, 12 IN
13	237933	HARNESS, PCB GROUND
18	219333	HARNESS, ENGINE ECM, TCD3.6, 10K
19	219334	HARNESS, ENGINE, TCD3.6
41	236979	FORMING, BUSS BAR
44	229819	PCBA, POWER DISTRIBUTION ASSY
45	161524	ASSEMBLY, POWER BUSS

ES0462F

Harness Map - Perkins 1104D Engine
Battery Power and Ground



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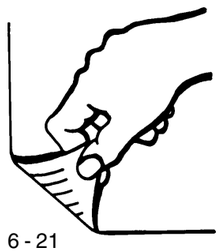
HARNESS LEGEND PERKINS 1104D

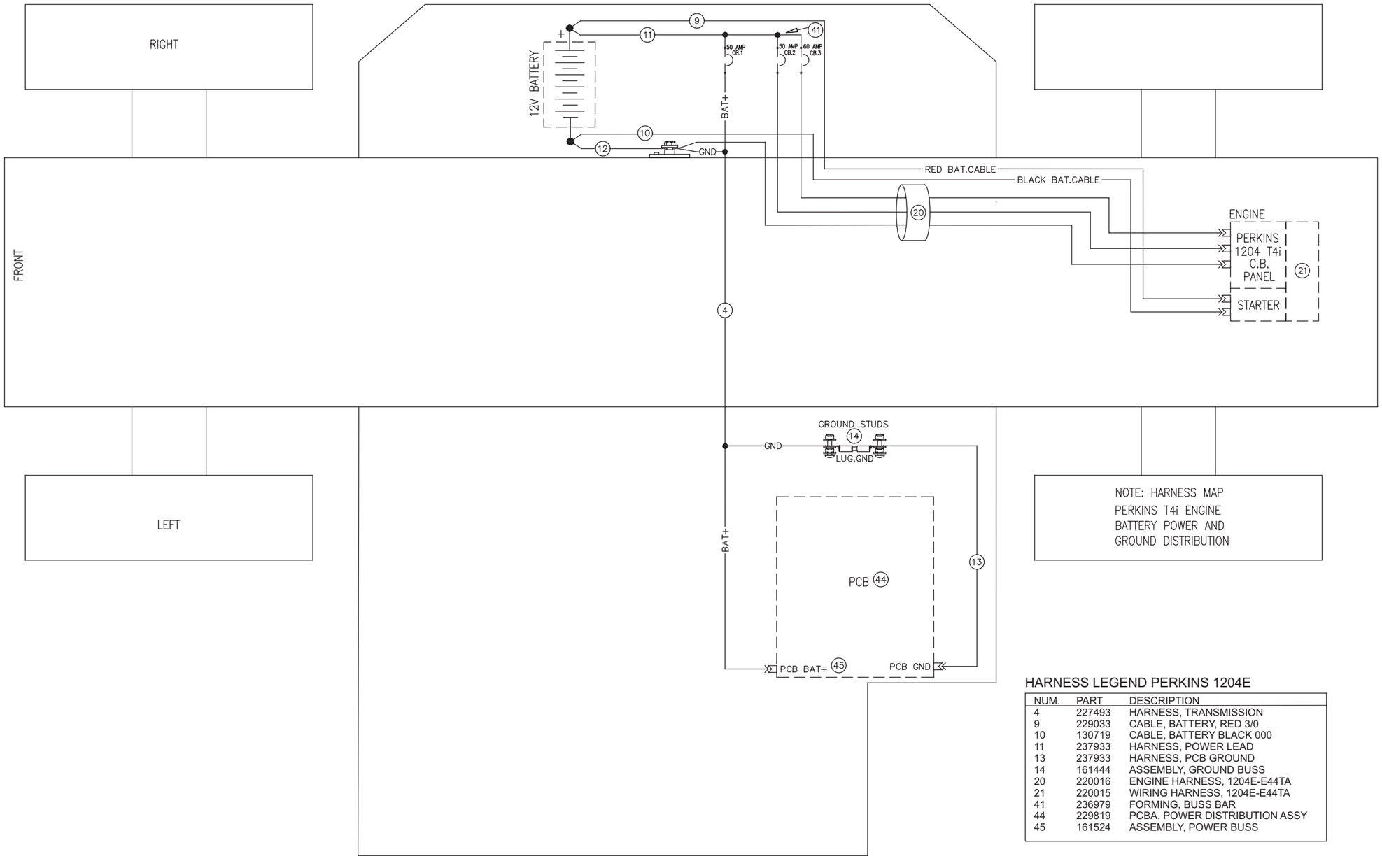
NUM.	PART	DESCRIPTION
4	227493	HARNESS, TRANSMISSION
9	229033	CABLE, BATTERY, RED 3/0
10	130719	CABLE, BATTERY BLACK 000
11	237933	HARNESS, POWER LEAD
12	7-319-17	GROUND STRAP, 12 IN
13	237933	HARNESS, PCB GROUND
14	161444	ASSEMBLY, GROUND BUSS
22	217940	HARNESS, ENGINE WIRING, PERKINS
41	236979	FORMING, BUSS BAR
44	229819	PCBA, POWER DISTRIBUTION ASSY
45	161524	ASSEMBLY, POWER BUSS

Harness Map - Perkins 1104D Engine
Battery Power and Ground



Harness Map - Perkins 854E Engine
Battery Power and Ground

Harness Map - Perkins 854E Engine
Battery Power and Ground

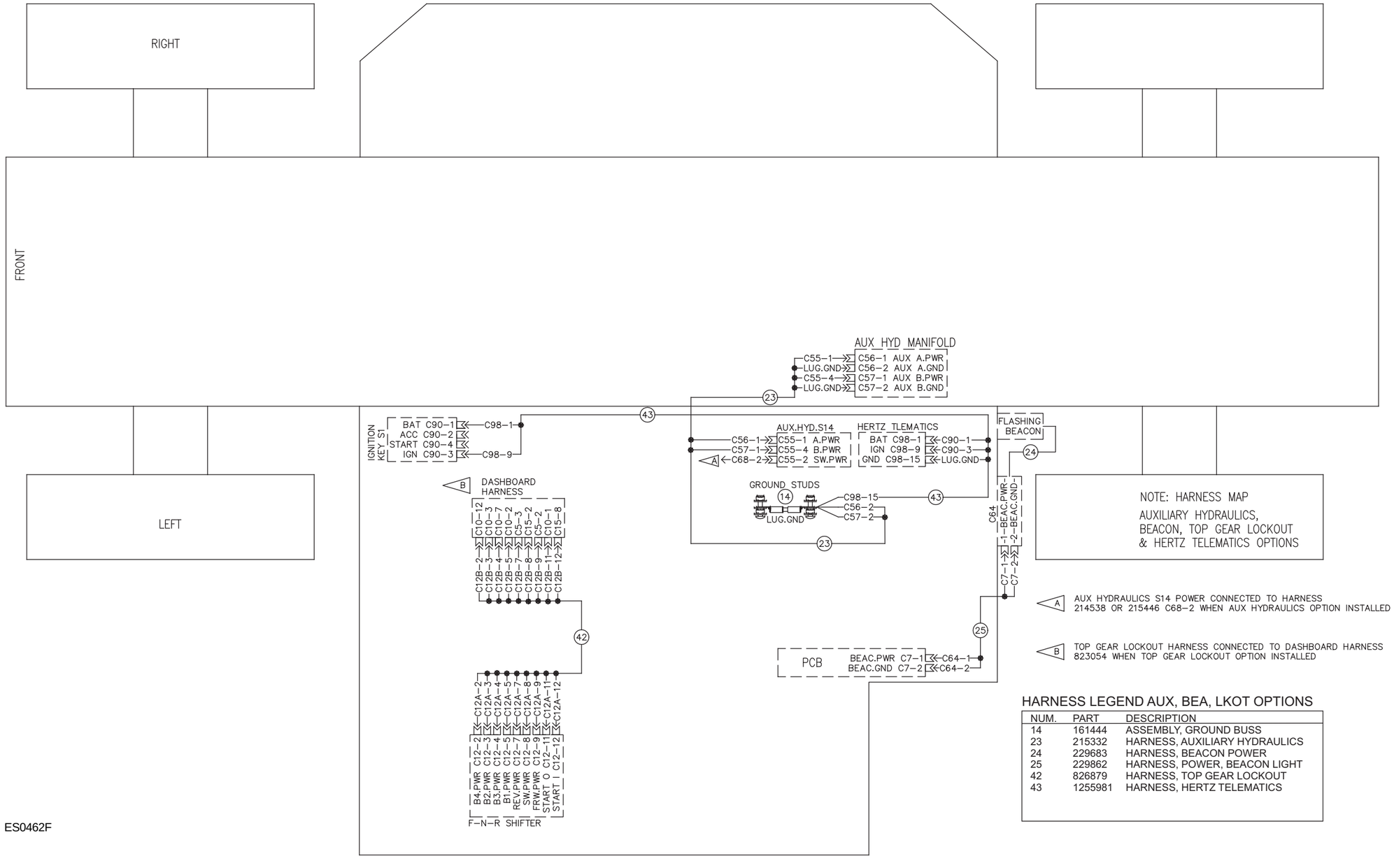


HARNESS LEGEND PERKINS 1204E

NUM.	PART	DESCRIPTION
4	227493	HARNESS, TRANSMISSION
9	229033	CABLE, BATTERY, RED 3/0
10	130719	CABLE, BATTERY BLACK 000
11	237933	HARNESS, POWER LEAD
13	237933	HARNESS, PCB GROUND
14	161444	ASSEMBLY, GROUND BUSS
20	220016	ENGINE HARNESS, 1204E-E44TA
21	220015	WIRING HARNESS, 1204E-E44TA
41	236979	FORMING, BUSS BAR
44	229819	PCBA, POWER DISTRIBUTION ASSY
45	161524	ASSEMBLY, POWER BUSS

ES0462F

Harness Map - Options
Auxiliary Hydraulics, Beacon and 3rd Gear Lockout



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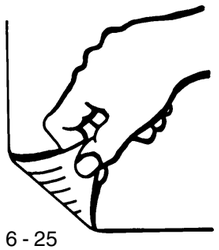
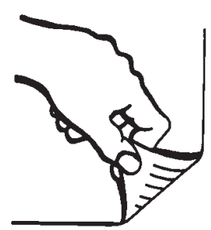
HARNESS LEGEND AUX, BEA, LKOT OPTIONS

NUM.	PART	DESCRIPTION
14	161444	ASSEMBLY, GROUND BUSS
23	215332	HARNESS, AUXILIARY HYDRAULICS
24	229683	HARNESS, BEACON POWER
25	229862	HARNESS, POWER, BEACON LIGHT
42	826879	HARNESS, TOP GEAR LOCKOUT
43	1255981	HARNESS, HERTZ TELEMATICS

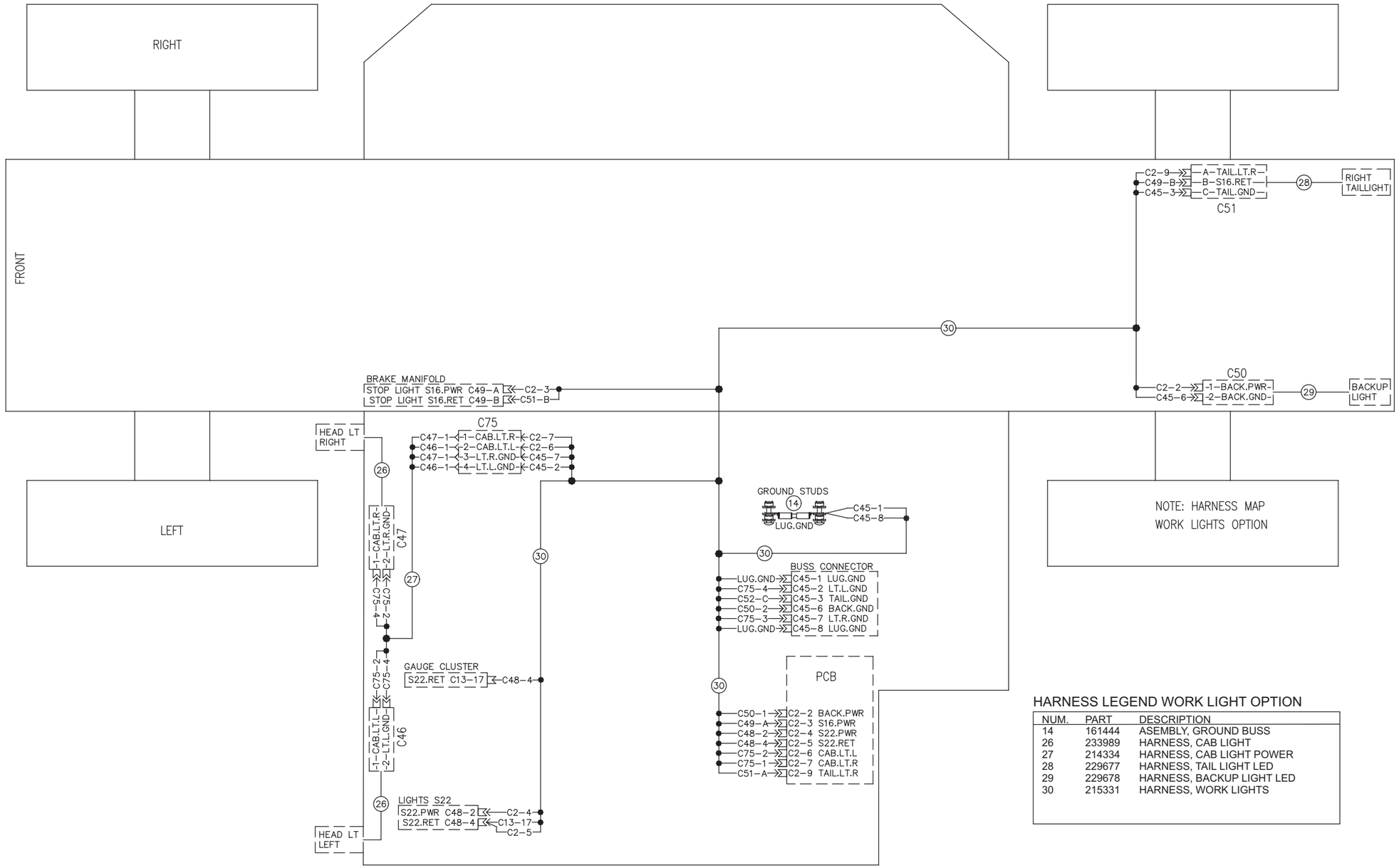
Harness Map - Options
Auxiliary Hydraulics, Beacon and 3rd Gear Lockout



Harness Map - Options
Work Lights



Harness Map - Options
Work Lights



HARNESS LEGEND WORK LIGHT OPTION

NUM.	PART	DESCRIPTION
14	161444	ASEMBLY, GROUND BUSS
26	233989	HARNESS, CAB LIGHT
27	214334	HARNESS, CAB LIGHT POWER
28	229677	HARNESS, TAIL LIGHT LED
29	229678	HARNESS, BACKUP LIGHT LED
30	215331	HARNESS, WORK LIGHTS

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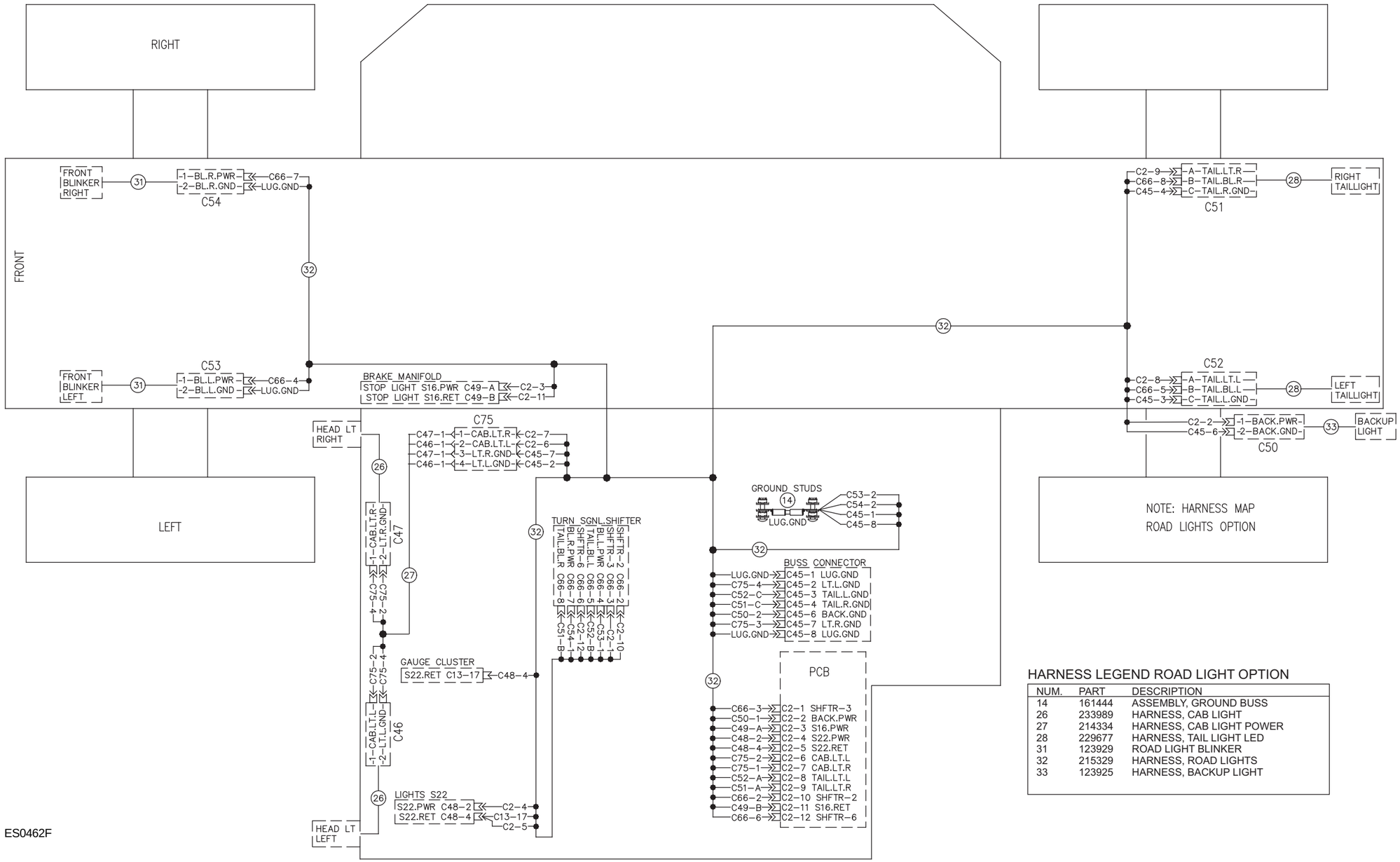
Harness Map - Options
Road Lights

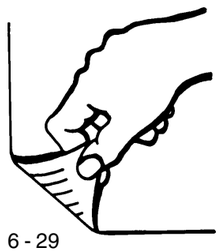


ES0462F

HARNESS LEGEND ROAD LIGHT OPTION

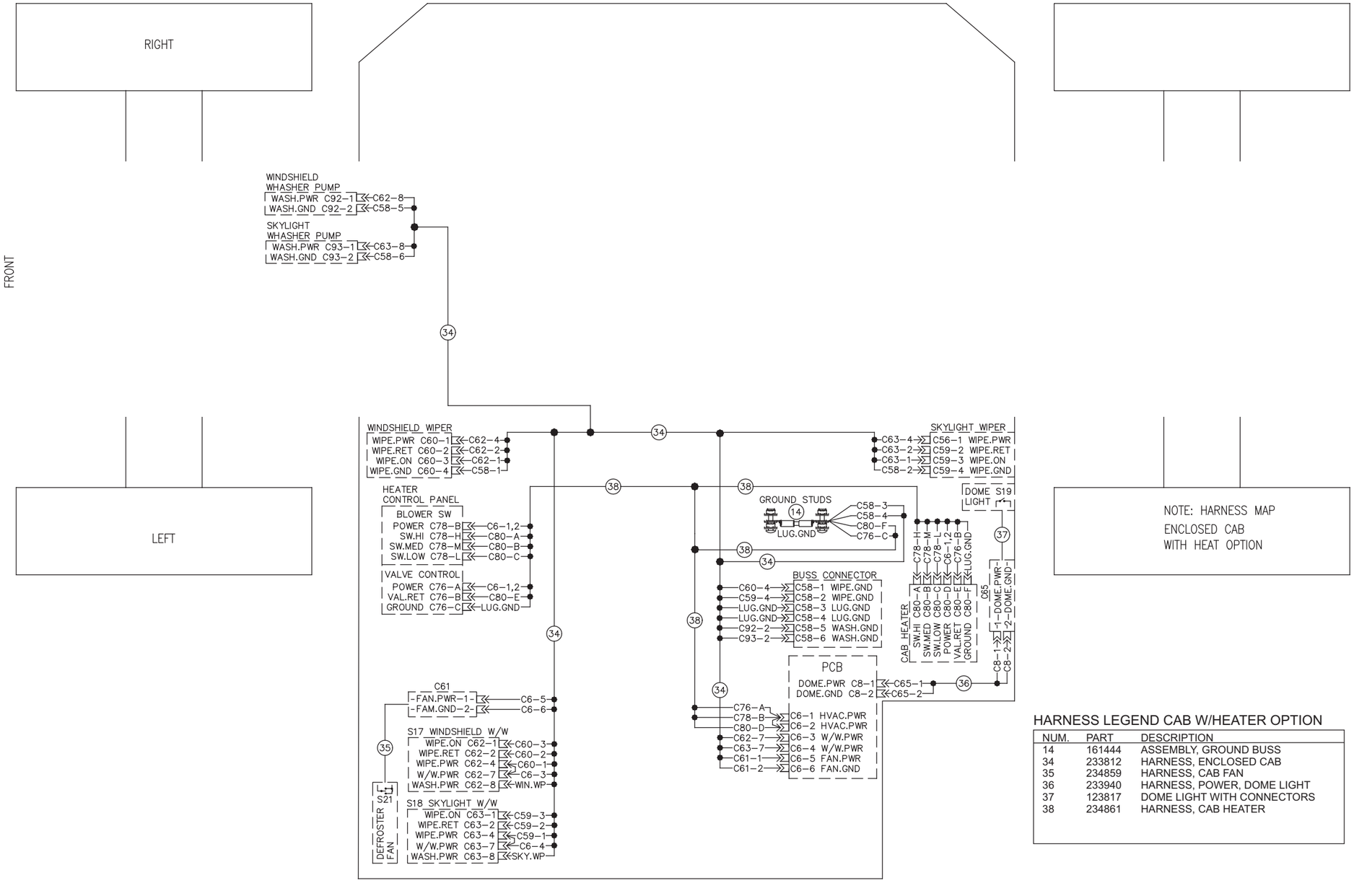
NUM.	PART	DESCRIPTION
14	161444	ASSEMBLY, GROUND BUSS
26	233989	HARNESS, CAB LIGHT
27	214334	HARNESS, CAB LIGHT POWER
28	229677	HARNESS, TAIL LIGHT LED
31	123929	ROAD LIGHT BLINKER
32	215329	HARNESS, ROAD LIGHTS
33	123925	HARNESS, BACKUP LIGHT

Harness Map - Options
Road Lights



Harness Map - Options
Enclosed Cab with Heater

Harness Map - Options
Enclosed Cab with Heater

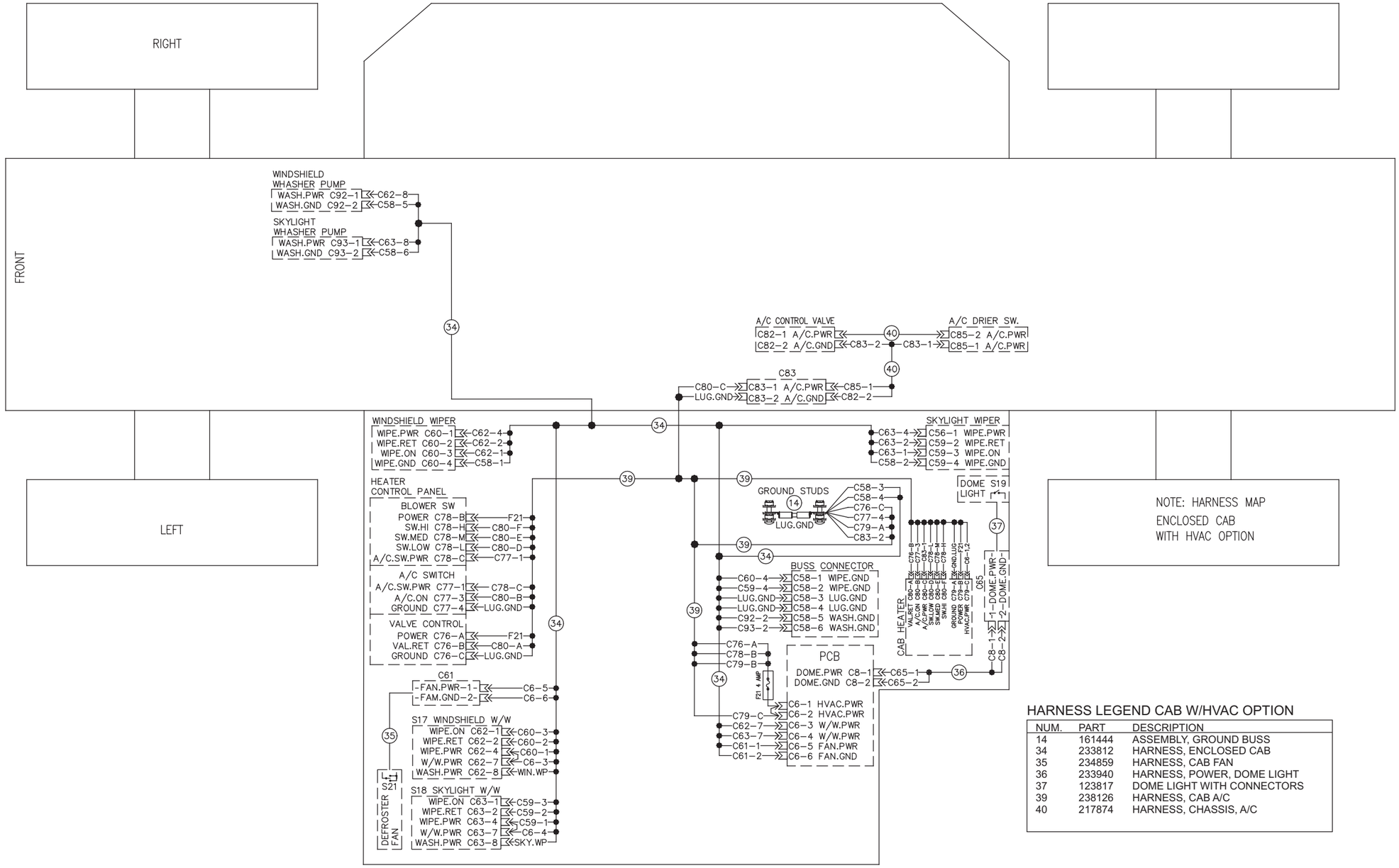


HARNESS LEGEND CAB W/HEATER OPTION

NUM.	PART	DESCRIPTION
14	161444	ASSEMBLY, GROUND BUSS
34	233812	HARNESS, ENCLOSED CAB
35	234859	HARNESS, CAB FAN
36	233940	HARNESS, POWER, DOME LIGHT
37	123817	DOME LIGHT WITH CONNECTORS
38	234861	HARNESS, CAB HEATER

ES0462F

Harness Map - Options
Enclosed Cab with HVAC

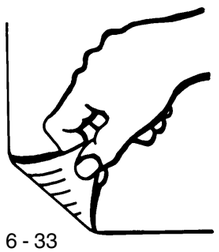


ES0462F

HARNESS LEGEND CAB W/HVAC OPTION

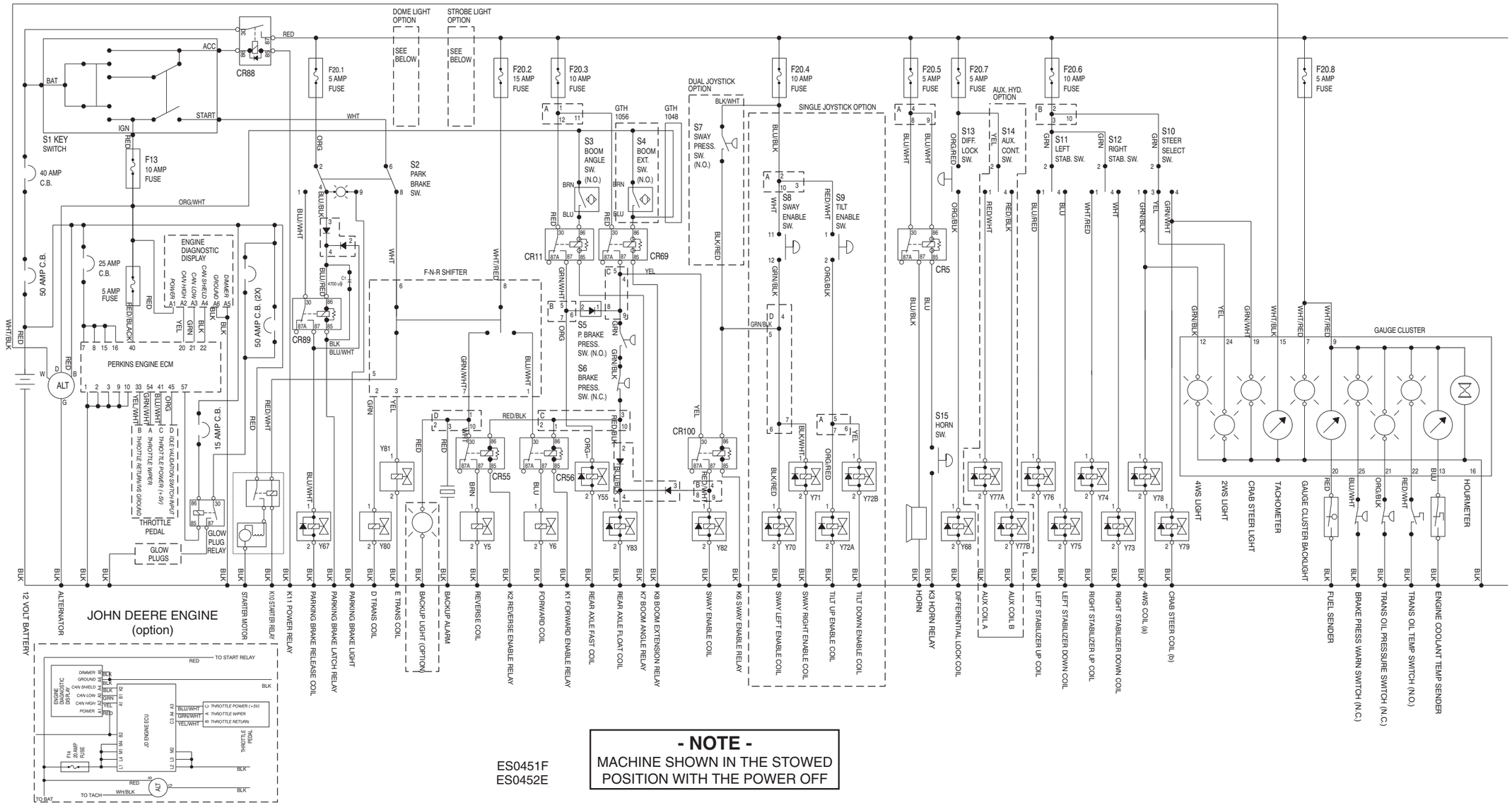
NUM.	PART	DESCRIPTION
14	161444	ASSEMBLY, GROUND BUSS
34	233812	HARNESS, ENCLOSED CAB
35	234859	HARNESS, CAB FAN
36	233940	HARNESS, POWER, DOME LIGHT
37	123817	DOME LIGHT WITH CONNECTORS
39	238126	HARNESS, CAB A/C
40	217874	HARNESS, CHASSIS, A/C

Harness Map - Options
Enclosed Cab with HVAC



Electrical Schematic - View 1
(before serial number GTH1012-16292)

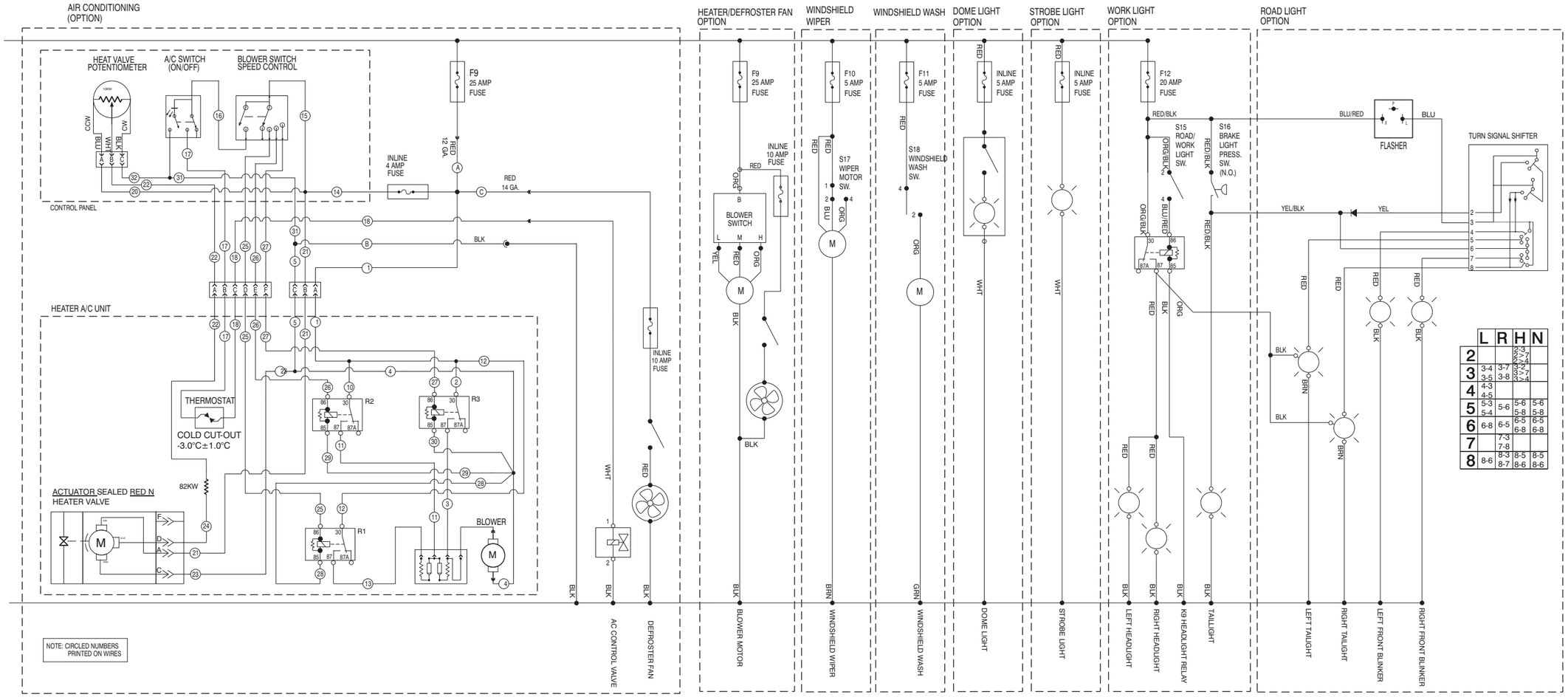
Electrical Schematic - View 1
(before serial number GTH1012-16292)



ES0451F
ES0452E

- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

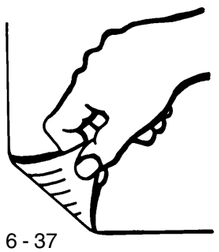
Electrical Schematic - View 2
(before serial number GTH1012-16292)



- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

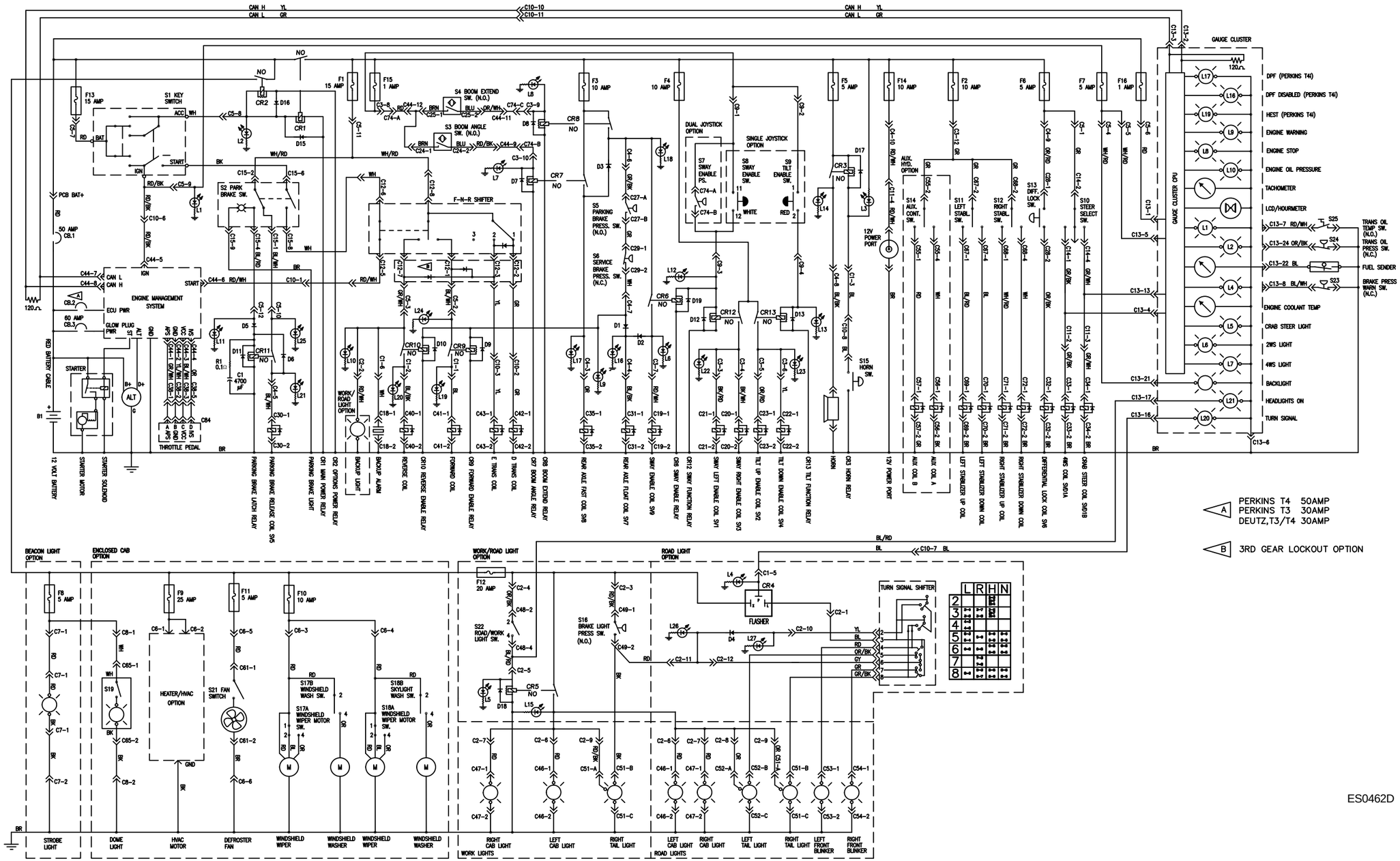
ES0451F
ES0452E

Electrical Schematic - View 2
(before serial number GTH1012-16292)

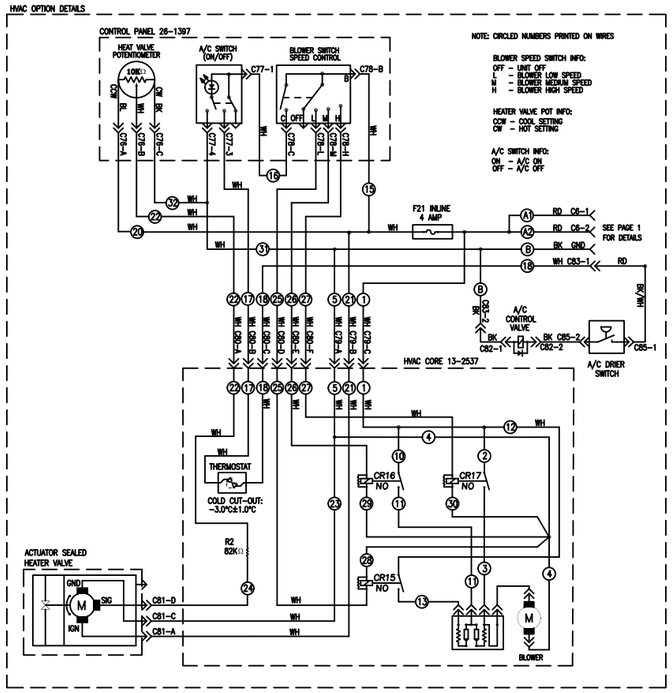


Electrical Schematic - View 1
(from serial number GTH1012-16292 to 19340)

Electrical Schematic - View 1
(from serial number GTH1012-16292 to 19340)

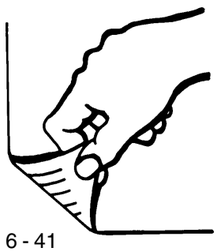


Electrical Schematic - View 2
(from serial number GTH1012-16292 to 19340)



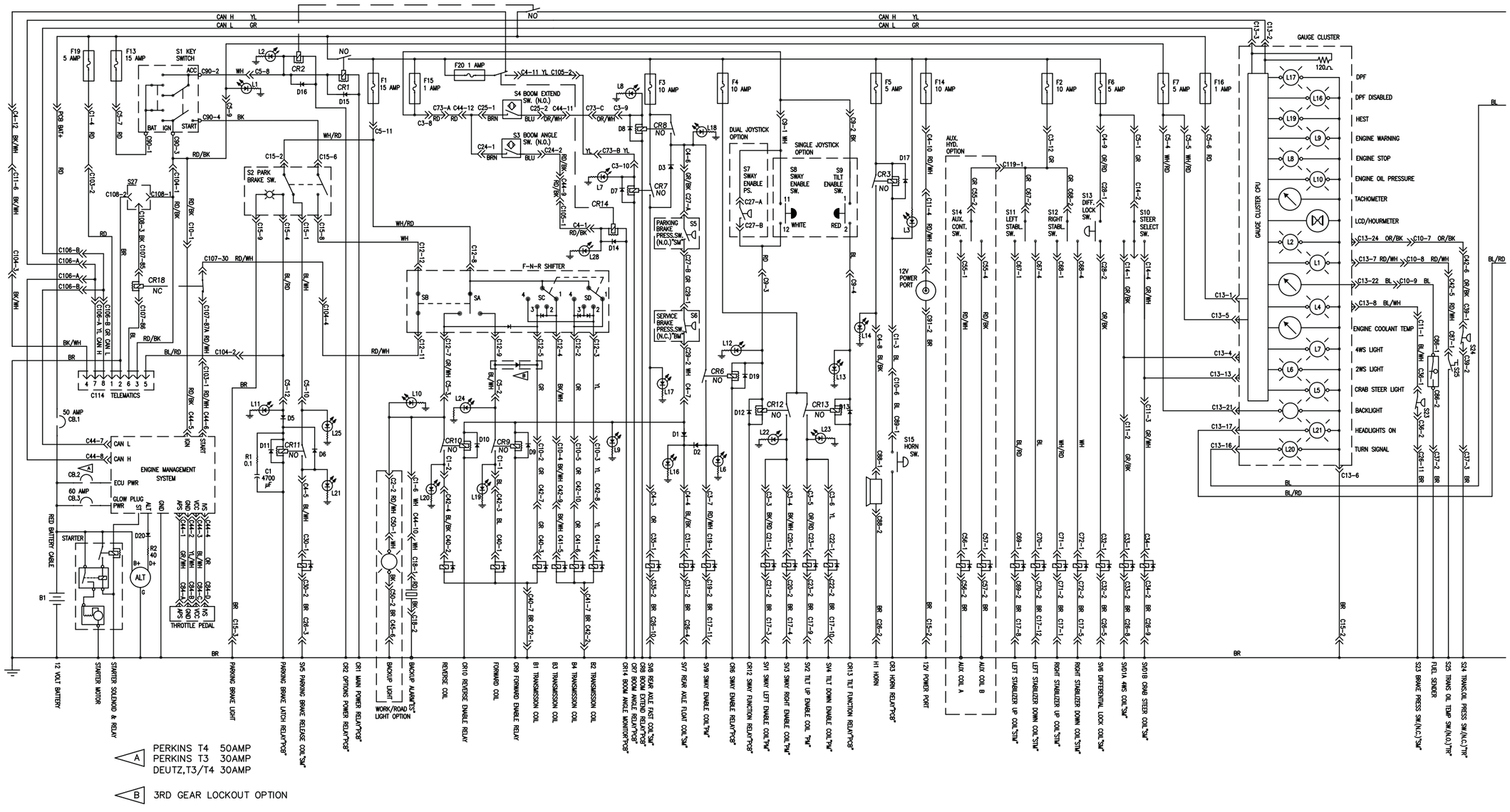
ES0462D

Electrical Schematic - View 2
(from serial number GTH1012-16292 to 19340)



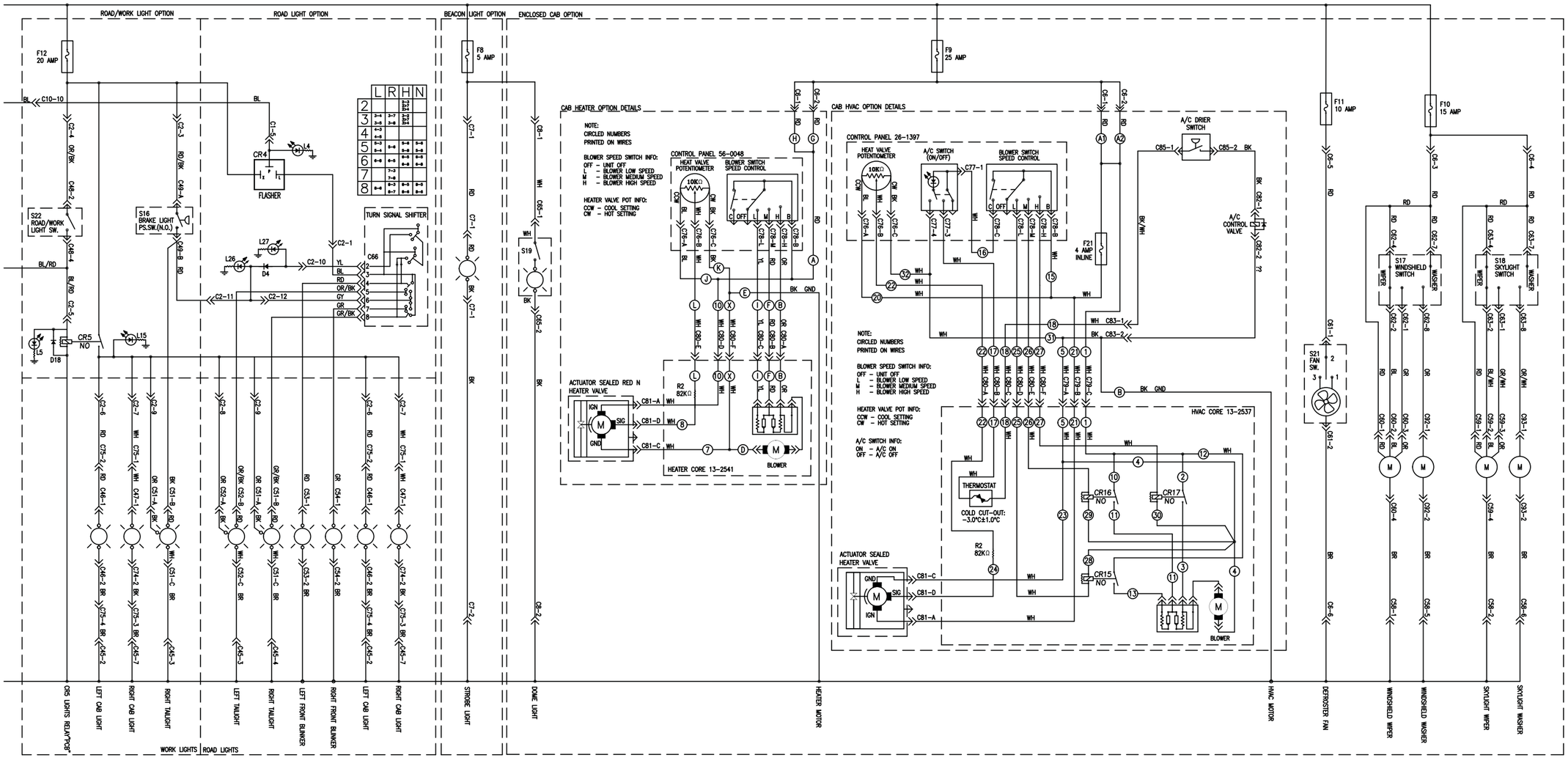
Electrical Schematic - View 1
(from serial number GTH1014-19341, GTH1014E-1001)

Electrical Schematic - View 1
(from serial number GTH1014-19341, GTH1014E-1001)



ES0462G

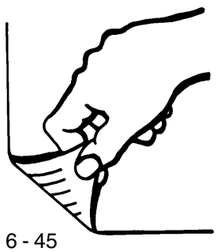
Electrical Schematic - View 2
(from serial number GTH1014-19341, GTH1014E-1001)



ES0462G

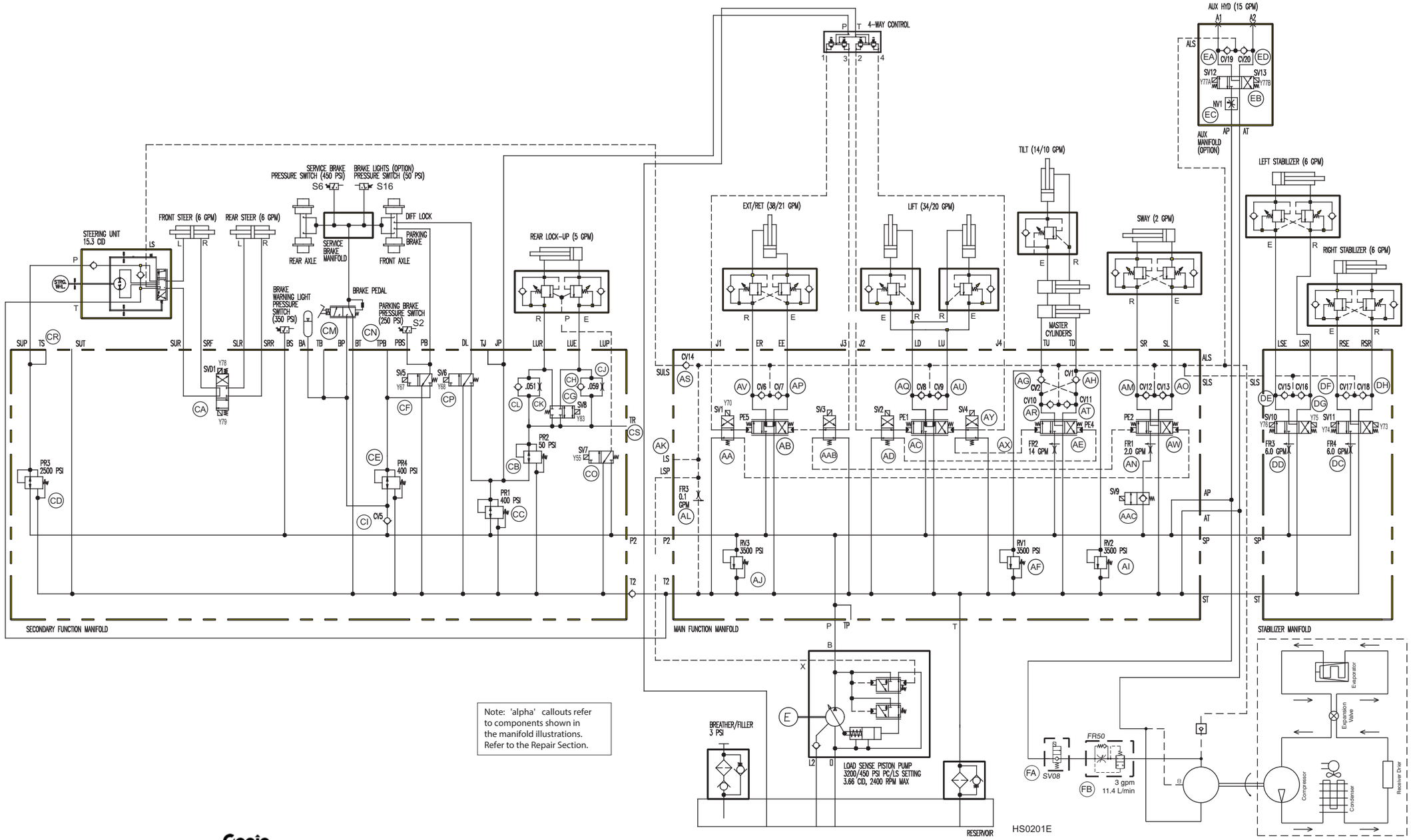
Electrical Schematic - View 2

(from serial number GTH1014-19341, GTH1014E-1001)



Hydraulic Schematic
Models with Single Joystick

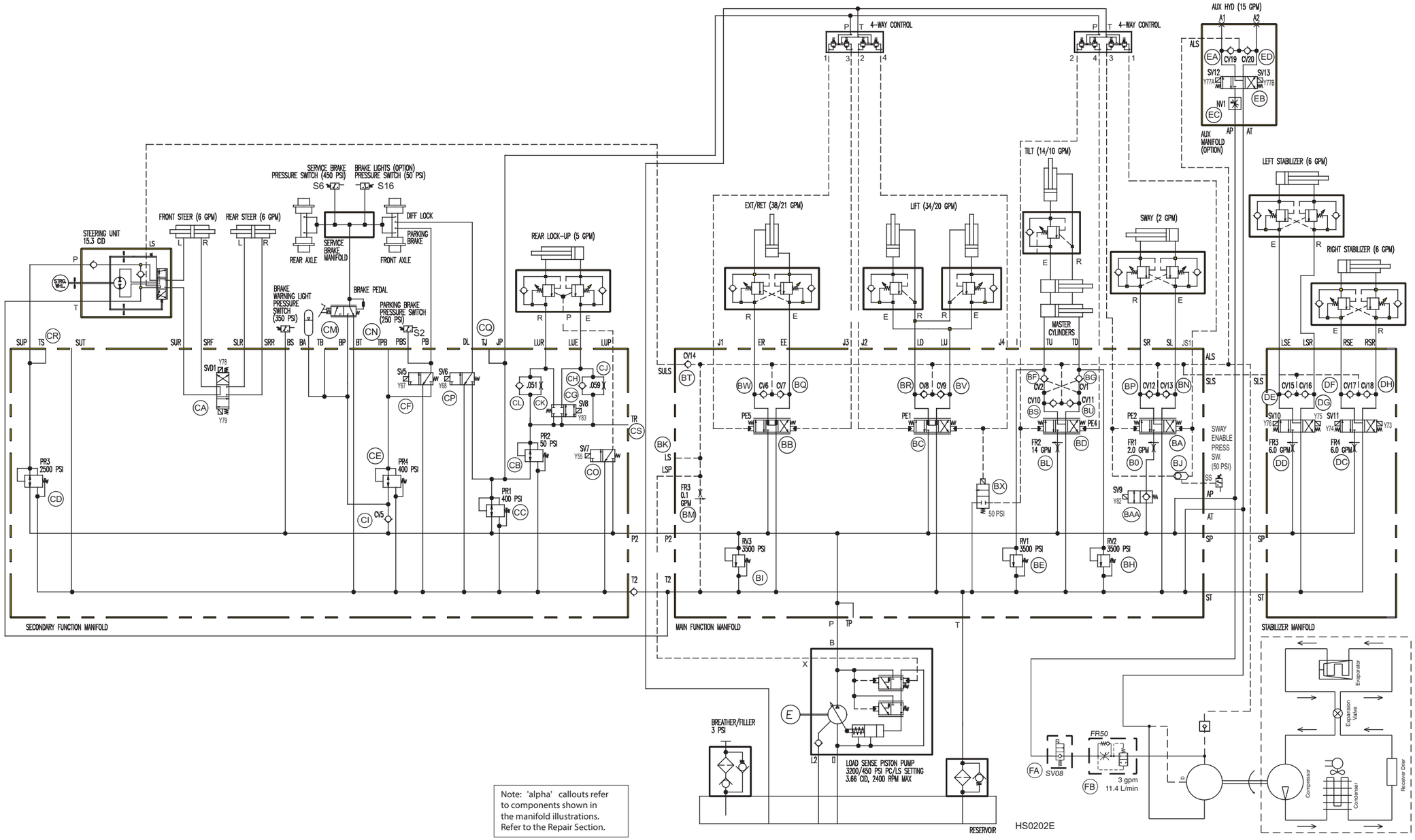
Hydraulic Schematic
Models with Single Joystick



Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

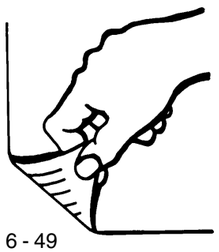
HS0201E

Hydraulic Schematic
Models with Dual Joystick



Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

Hydraulic Schematic
Models with Dual Joystick



California Proposition 65

Warning

The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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